THEORETICAL PREDICTION AND EXPERIMENTAL VERIFICATIONS OF THE NEW CHEMICAL SPECIES OF Magnecules

Ruggero Maria Santilli
Institute for Basic Research, P.O.Box 1577, Palm Harbor, FL 34682, U.S.A.
ibr@gte.net, http://home1.gte.net/ibr/
Received December 23, 1998

Abstract

As a result of comprehensive studies by various scholars initiated back in 1978, a generalization-covering of quantum mechanics under the name of hadronic mechanics has been built and has now reached operational maturity. Thanks to these results, D. D. Shillady and I have introduced in three preceding papers a generalization-covering of quantum chemistry under the name of hadronic chemistry and proved its effectiveness in achieving representations of molecular data accurate to several digits. In this paper I present, apparently for the first time, the most compelling experimental evidence to date supporting hadronic mechanics and chemistry, the theoretical prediction and several independent experimental verifications of a new chemical species, i.e., atoms and molecules bonded by a new force. The origin of the new species rest in the magnetic moment of electrons in their orbits around nuclei, which has been ignored throughout this century due to their spherical distribution. In this paper I show that the polarization in a plane of the orbit of the electron of the hydrogen atom implies the emergence of a magnetic moment which is 1,316 bigger than the magnetic moment of the nucleus (the proton). Such a large value is then sufficient to permit the theoretical prediction of corresponding strong magnetic bonds between atoms and molecules which are stable at ordinary conditions. Various consistency aspects imply the necessary use of hadronic mechanics and chemistry, e.g., to prevent that all molecules are ferromagnetic. In view of the magnetic origin of the new bond, I submit the names of magnecules for the new species, in order to distinguish it from the conventional "molecules" denoting valence bonds. I then present various experimental confirmations by independent laboratories on the existence and anomalous properties of magnecules in gases, liquids and solids. The memoir ends with an indication without detailed treatment that the new species implies the birth of new technologies currently under development by Toups Technology Licensing Corporation, of Largo Florida, Givaudan-Roure Corporation of Teaneck, New Jersey, and other U.S. Corporations.

Copyright © 1998 Hadronic Press, Inc, Palm Harbor, FL 34682-1577, U.S.A.
THEORETICAL PREDICTION AND EXPERIMENTAL VERIFICATIONS
OF THE NEW CHEMICAL SPECIES OF Magnecules
Ruggero Maria Santilli

TABLE OF CONTENT

1. INTRODUCTION, 791

2. THEORETICAL PREDICTION OF MAGNECULES, 804
2.1. Definition of magnecules, 804
2.2. The magnetic origin of the new species, 806
2.3. The magnetic polarization of the orbits of valence electrons, 807
2.4. Theoretical representation of magnecules, 809
2.5. Numerical value of the magnetic moment of polarized orbits, 811

3. EXPERIMENTAL EVIDENCE OF MAGNECULES IN GASES
   AT TOUPS TECHNOLOGY LICENSING, 814
3.1. Creation of Magnecules in gases, 814
3.2. Anomalies of magnecules to be detected, 817
3.3. Spectroscopic evidence of magnecules in gases, 822
3.4. Enhanced energy release of magnetically polarized gases, 848
3.5. The new technology of magnetically polarized gases at Toups Technology Licensing, 850

4. EXPERIMENTAL EVIDENCE OF MAGNECULES IN LIQUIDS
   AT GIVAUDAN-ROURE CORPORATION, 851
4.1. Creation of magnecules in liquids, 851
4.2. Photographic evidence of magnecules in liquids, 852
4.3. Spectroscopic evidence of magnecules in liquids, 858
4.4. Magnetic mutations of physical characteristics in liquids, 882
4.5. Examples of industrial applications of magnetically polarized liquids, 887
4.6. Evidence of magnecules in solids, 887

5. CONCLUDING REMARKS, 888

Acknowledgments, 891
References, 893
1. INTRODUCTION

It is known by experts in the field although rarely indicated in Ph. D. courses or in the technical literature, that, despite outstanding achievements of clear historical proportions achieved throughout this century, quantum chemistry [1] is still afflicted by numerous fundamental unsolved problems, insufficiencies or shear inconsistencies such as:

1) The lack of a sufficiently strong molecular bonding force, because the forces currently assumed (the exchange, van der Waals and other forces) were conceived for nuclear structures in which they are known to be weak, thus demanding the additional introduction of the strong nuclear forces

2) The impossibility to explain why the hydrogen, water and other molecules have only two hydrogen atoms, because the currently used bonding forces of nuclear type were conceived for an arbitrary number of constituents.

3) The impossibility to achieve an exact representation from unadulterated quantum principles of molecular binding energies because missing of about 2% of the experimental values, e.g., in the selfconsistent treatments.

4) More accurate representations of molecular characteristics have been recently achieved via structural modification of the coulomb law with gaussian and other factors called "screenings". However, on rigorous scientific grounds, these manipulations prohibit the very use of the term "quantum" mechanics and chemistry because gaussian screenings of coulomb force imply the loss of the hydrogen atom, the lack of stability of all electron orbits, and the absence of the very notion of "quantum" of energy which is known to requires stable orbits for its emission or absorption, as very well known. A fully similar occurrence holds for variational methods which, besides admitting unlimited number of free parameters of totally unknown origin and motivation (thus being of purely mathematical value), can be proved to violate the very conditions to preserve a "quantum".

5) The impossibility to conduct meaningful thermochemical representations because the 2% currently missing in the binding energy implies an error which is 50 times bigger than the average energy of a thermochemical reaction.

6) Excessive computer times in calculations despite the use of the most modern possible computers.

7) Dramatic disagreement between the correlations used in current orbital theories (which refer to an arbitrary number of electrons), and the experimental evidence that correlations only occur between pairs of electrons.

8) The impossibility to represent exactly electric and magnetic moments of molecules which at times are wrong even in the sign, let alone the value.

9) The prediction by quantum chemistry that all molecules are
ferromagnetic (Fig. 1.1), which is in dramatic disagreement with experimental evidence.

It is evident that the lack of solution of the above fundamental problems is not due to quantum chemistry per se, but rather to the main underlying theory, quantum mechanics. In fact, it is today known that most deficiencies are due to the complete absence of a scientific-quantitative representation by quantum mechanics of the conditions of deep overlappings of the extended wavepackets of electrons.

FIGURE 1.1 A schematic view of the prediction by quantum chemistry that all molecules are ferromagnetic, here expressed for the case of the simplest possible hydrogen molecule $H_2 = H-H$ at absolute zero degree temperature and in the absence of any motions. The prediction is an un-avoidable consequence of the current conception of molecular structures in which the bond is due to exchange and other forces of nuclear type, as a
consequence of which each atom preserves its individuality. The most rigorous discipline 
of this century, quantum electrodynamics, then establishes that, under an external 
magnetic field South–North the orbits of all valence electrons must acquire the opposite 
polarization North–South, resulting in a total net magnetic polarity $H_\uparrow - H_\downarrow$ which is in 
dramatic disagreement with experimental evidence. The only way known to this author to 
resolve the inconsistency is by assuming a much stronger correlation among the two 
electrons which, however, is outside quantum mechanics and chemistry, but fully 
permitted by their hadronic coverings [2,3].

FIGURE 1.2: A schematic view of the behavior of the valence electrons of the conventional 
model of the water molecule $\text{H}_2\text{O} = \text{H} - \text{O} - \text{H}$ at 0 K under an external magnetic field South–North. As it is the case for the hydrogen molecule, quantum electrodynamics predicts that, 
under the currently assumed independence of the atoms and weak correlations, each atom
must assume a polarization North-South opposite to that of the external field, resulting in the total net magnetic polarity of the water molecule $\text{H}_2\text{O}^{\text{+}}+\text{H}_2\text{O}^{\text{-}}$, which is also in dramatic disagreement with experimental evidence, since water is diamagnetic as well known. After studying this inconsistency for years, the only resolution I know is the conception of a new model of the water molecule as achieved by hadronic mechanics and chemistry [2,3].

Quantum mechanics is **linear**, **local-differential** and **potential-hamiltonian unitary**, while the conditions of deep overlapping of the wavepackets is known to be **nonlinear**, **nonlocal-integral** and **nonpotential**, thus **nonhamiltonian** and, therefore, **nonunitary**. Note that the **nonlocality** is caused by the overlapping of the "extended wavepackets" of the electrons while the charge remains perfectly "point-like".

![Diagram](image)

**FIGURE 1.3**: A schematic view of the physical conditions at the foundation of the new chemical species introduced in this paper, the deep overlapping of the extended wavepackets of the valence electrons under their point-like charge structure. These conditions are known to be nonlinear, nonlocal and nonpotential, thus nonhamiltonian—nonunitary and, therefore, outside any realistic hope of scientific treatment via quantum
mechanics and chemistry. It was shown in papers [3] that the ignorance of the conditions of this figure in support of the quantum mechanical point-like as well as linear, local and potential abstraction of overlapping wavepackets of the electrons has implied the inability to reach a deeper and more accurate understanding of molecular structures.

In view of the above and other insufficiencies of quantum mechanics in all branches of science (see Ref. [2e] for a comprehensive presentation), a generalization-covering of the theory under the name of hadronic mechanics was proposed by R. M. Santilli [2a] when at Harvard University back in 1978, and then studied by numerous mathematicians, theoreticians and experimentalists (for a comprehensive presentation up to 1995 see monographs [2c] with an update to 1997 in memoir [2d]).

Operational maturity on the formulation and applications of quantum mechanics was reached only recently in memoir [2d] thanks to the use of the new iso-, geno- and hyper-mathematics which permitted the first known invariant formulation of nonlinear, nonlocal and nonunitary effects. Hadronic mechanics has therefore three branches called iso-, geno- and hyper-mechanics which are used for the representation of isolated-conservative-reversibles, open-nonconservative-irreversible and irreversible-multi-valued structures, respectively. Numerous applications and experimental verifications of hadronic mechanics now exist in various fields (see the outline in Sect. 3.15 of Ref. [2d]).

Thanks to the achievement of maturity of hadronic mechanics, R. M. Santilli and D. D. Shillady [3] have recently constructed a generalization-covering of quantum chemistry under the name of hadronic chemistry which is also based on the novel iso-, geno- and hyper-mathematics. Hadronic chemistry then comprises three corresponding branches called iso-, geno- and hyper-chemistry, which are used for a more accurate representation of molecular structures, irreversible chemical reactions and biological systems, respectively.

In particular, Paper I [3a] propose the main formalism of the novel hadronic chemistry. The subsequent Papers II [3b] and III [3c] propose a novel isochanical model of molecular bonds whose main feature is the assumption that pairs of valence electrons from two different atoms couple themselves in a singlet quasiparticle state at short distances (of 1 fm or less) we have called isoelectronium, with the following main features (see Sect. 5 of Paper II [3c]).

Main characteristics of the isoelectronium:
Charge: 0; spin 0; magnetic moment 0; rest energy 1.02 MeV; (1.1)
Radius $r_c = b^{-1} = 6.8432329 \times 10^{-11} \text{ cm} = 0.015424288 \text{ bohrs}$. 

FIGURE 1.4: A schematic view of the reason why quantum mechanics is exactly valid for the structure of one hydrogen atom, but only approximately valid for the two atoms of the hydrogen molecule. In the former case we have very large mutual distances between the electron and the nucleus which permits an effective approximation of the electron's wavepacket as being point-like. In turn, this implies the exact applicability of the linear, local and potential axioms of quantum mechanics. In the case of the hydrogen molecule these conditions are no longer valid because we now have the deep overlapping of the wavepackets of the valence electrons at distances of 1 fm or less. Under these conditions, a point-like approximation of the wavepacket of the electrons is no longer valid. It then follows that quantum mechanics and chemistry cannot be exactly valid for molecular structures. Hadronic mechanics and chemistry have been constructed precisely for the quantitative invariant description of the nonlinear, nonlocal and nonpotential conditions of deep wave–overlapping of valence electrons or of other particles.
The above new conception of molecular bonds has the following primary implications:

1) It introduces for the first time a new strong, attractive forces among the two identical electrons at distances of 1 fm or less suitable to represent the strength of molecular bonds in the physical reality, which is essentially the equivalent in chemistry of the strong force in nuclear physics.

2) It explains for the first time why the hydrogen, water and other molecules have only two hydrogen atoms. In fact, once two valence electrons are bonded into the singlet isoelectronium, they evidently reject the bonding of any additional electron.

3) Isochemistry has permitted the first representation of binding energies which is accurate to the seventh digit.

4) The above accurate representation occurs under the exact validity of the basic axioms of isochemistry without ad hoc adulterations.

5) Since the representation of binding energies is accurate to the seventh digit, isochemistry permits accurate thermochemical calculations.

6) Isochemistry implies convergence of power series much faster than those of quantum chemistry with a reduction of computer usage at least 1,000 times.

7) Isochemistry only allows correlations among pairs of electrons at all levels of study.

8) Isochemistry has provided a representation of electric and magnetic moments which is also accurate to several digits, let alone having the correct sign.

9) Isochemistry resolved the inconsistent prediction by quantum chemistry that all molecules are ferromagnetic (Figs. 1.8 and 1.9).

It should be indicated that Papers II and III provided a quantitative study of both possibilities that the isoelectronium is stable or unstable, by leaving the resolution of these alternative to subsequent studies upon the availability of additional theoretical and experimental evidence.

In particular, the full stability of the isoelectronium was reached under the exact validity of the axioms of isochemistry which yields an attractive hulten potential as representing the strong bond of the two valence electrons in the isoelectronium. By comparison, the case of partial stability of the isoelectronium was reached under an approximation of these basic principles which yields an attractive, yet weaker force responsible for the isoelectronium (rather than the much stronger hulten force).

The new evidence presented in this paper appears to favor the case of a
mostly stable isoelectronium, because necessary to resolve the inconsistency of Figs. 1.1 and 1.2.

If the bonding of valence electrons is only partially stable, this necessarily implies that all molecules should have a well defined magnetic polarizability whose value is dependent on the time percentage of said instability.

For instance, suppose that the isoelectronium represents only the tendency of the valence electrons to couple-correlate themselves as in Sect. 8 of Paper II [3c] (see also Fig. 1.5), and suppose that their bonding only occurs for 10% of the time, thus having unpaired valence electrons for 90% of the time as in conventional quantum chemistry.

\[ \text{FIGURE 1.5: A schematic view of the mostly unstable isoelectronium of Papers II and III [3], essentially representing the tendency of electron pairs to have deep correlations at short distances in singlet coupling (evidently from Pauli's exclusion principle), although for a small period of time. This short lifetime originates from an approximation of the hulien potential well of the isoelectronium via one single gaussian.} \]

\[ 
\begin{align*}
    & H^+ \quad H^+ \\
    & H^+ \quad \cdot \quad H^+ \\
    & \tau < 10^{-13} \text{ sec} \\
    & H^+ \quad \cdot \quad H^+
\end{align*}
\]
lifetime of the isoelectronium increases with the improvement of the approximation via several gaussians, all the way to the full stability of the next figure.

It is then evident that, under the latter assumptions, all molecules must acquire a net magnetic polarity under an external magnetic field, thus being ferromagnetic, although with smaller numerical values as compared to the conventional model of molecular bonds.

The only way known to this author to resolve such a dramatic disagreement between the theory and the experimental data on the behavior of molecules under external magnetic fields, is the assumption of a mostly stable isoelectronium.

**FIGURE 1.6.** A schematic view of the mostly stable isoelectronium at absolute zero degree temperature and in the absence of rotations or other collective motions, here depicting the isochemical model of the hydrogen molecule. Note that when rotations at ordinary temperature are admitted, the model recovers the conventional space distribution of the hydrogen molecule. The model also holds for generic dimers HO, HC, etc. The model is here depicted in terms orbits of the valence electrons (rather than of density distributions). The main assumption is that the two valence electrons, one per each atom, correlate themselves into a bonded singlet state at distances of 1 fm or less, called isoelectronium, which describes a oo-shaped orbit around the respective two nuclei much similar to the orbit of a planet in certain binary star systems. The isoelectronium is then responsible for the attractive force.
between the two atoms. The *binding energy* is instead characterized by the \( \sigma \)-shaped orbit of the isoelectronium around the two nuclei conceptually represented in this figure via a standing wave for a particle of spin \( 0 \) and charge \( -2e \). Note that, at ordinary temperature, rotations would reproduce the conventional spherical distribution.

**FIGURE 1.7:** A schematic view of the *isoechemical model of the water molecule* first proposed in Paper II [3c] with two isoelectronia (one per each HO dimer), presented at absolute zero degree temperature and in the absence of any rotational or other motions. *Note again that when rotations at ordinary temperature are admitted, the model recovers the conventional "Mickey Mouse" shape of the water molecule* [1]. The model is also depicted in terms of *orbits* of the valence electrons,
without precluding the description in terms of density distributions familiar in the existing literature. As one can see, a visual inspection of the new model resolves some of the fundamental open problems of the current conception of the water molecule, such as the lack of a sufficiently strong bonding force or the inability to explain why the water molecule has only two hydrogen atoms and only one oxygen.

**FIGURE 1.8:** A schematic view of the resolution of the inconsistency of Fig. 1.1 permitted by the novel isochemical model of molecular bonds, here illustrated for the case of the simplest possible hydrogen molecule at 0 K and in the absence of any motion. In the conventional quantum model the valence electrons preserve their individuality, thus implying the mandatory prediction of a total net magnetic polarity under an external
magnetic field. For isochemistry the two valence electrons are no longer independent, but are bonded into the isoelectronium which describes an oo-shaped orbits around the two nuclei with opposite rotational motion in the two o-branches. The impossibility of a total net magnetic polarity is then evident and so is the resolution of the inconsistency of Fig. 1.1. Note the necessity for the stability of the isoelectronium for the resolution of said inconsistency.

![Diagram](image)

**FIGURE 1.** Schematic view, again at absolute zero degree temperature and in the absence of motions, of the resolution of the inconsistency of quantum chemistry of Fig. 1.2, namely, the impossibility for the isochemical model of the water molecule to acquire a
net magnetic polarity under an external magnetic field. Note that the resolution presented in this figure is that for the worse possible configuration of the isochemical model, that with the same external polarity South–South. The resolutions of this figure and that of the preceding figure are at the foundation of the new chemical species introduced in this paper.

Due to the importance of the topic, interested scholars are encouraged to present alternative models with a proof of the impossibility for molecules to acquire a net magnetic polarity under a mostly unstable isoelectronium and/or correlations of valence electrons.

I should stress that the isoelectronium cannot be 100% stable and small instabilities must be assumed. This is due to the fact that isochemistry coincides with quantum chemistry at distances sufficiently bigger than 1 fm [3]. In particular, isochemistry preserves exchange, van der Waals and other forces of current use. In turn, the latter forces necessarily imply a small instability of the isoelectronium. The same small instability can be reached under relativistic and field theoretical treatments.

Throughout this analysis I shall therefore assume that in the first nonrelativistic approximation of this paper, the isoelectronium is a stable singlet state with characteristics (1.1), while small instabilities should be treated in future relativistic or field theoretical studies.

In this paper I cannot possibly review hadronic mechanics and chemistry to avoid an un-necessary and prohibitive length. However, the reader should be aware that a technical understanding of this paper requires a technical knowledge of hadronic mechanics at least as presented in memoir [2d], and of quantum chemistry at least as presented in Papers I, II and III [3].

Finally, in reading this paper chemists should keep in mind that I am a theoretical physicist. Therefore, the used terminology is that of physics rather than chemistry, although I have made an effort in trying to identify both terminologies for the main aspects of the analysis to render the paper accessible to both physicists and chemists.

It should be however kept in mind that the foundations of the new species are purely physical, thus rendering appropriate the use of the physics terminology. Chemistry and related terminology are expected to be appropriate in the study of the chemical behavior of the new species.
2. THEORETICAL PREDICTION OF MAGNECULES

2.1. Definition of magneecules. In this paper I present, apparently for the first time, the theoretical prediction permitted by hadronic mechanics [2] and chemistry [3] of the first new chemical species since the discovery of the valence bonds in the past century, where by "new species" I mean "conventional atoms and molecules bonded by a new force".

The main hypothesis is that atoms and molecules can be subjected to a new polarization of the orbits of (at least the) valence electrons, where "polarization" is intended in physics as the acquisition of a symmetry axis (or plane) with a fixed orientation in space (apparently called in chemistry the "cyclotron resonating orbit"), and the polarization is such to produce a magnetic field sufficiently strong to permit a magnetic bond stable at ordinary conditions of temperature and pressure.

The new species is submitted under the name of magneecules and other terms based on the prefix "magne" indicating magnetic bonds, while the name "molecules" will be used in its conventional meaning of denoting valence bonds.

DEFINITION 2.1: "Magneecules" constitute a new chemical species composed by conventional neutral atoms and molecules in liquids, gases or solids under new magnetic bonds due to the polarization of the orbits of (at least the) valence electrons which is stable at ordinary conditions and possesses the following characteristics:

1) The new species should not exist under sole valence bonds, e.g., because having a molecular weight much bigger than that of the heaviest molecule of substance considered;

2) The new species is identified in mass spectrometry by new peaks not present in the same substance without magnetic polarization;

3) The new peaks result to be "unknown" in the computer search among all known conventional molecular structures;

4) The new peaks have no infrared (for gases) or ultraviolet (for liquids) signature at all;

5) The sole infrared or ultraviolet signatures of the new peaks are those of the conventional atoms or molecules constituting the new species;

6) The ultraviolet or infrared signatures of conventional atoms or molecules in the new species are generally anomalous, thus indicating a deformation of their electron orbitals called "mutation";
VII) The new species has anomalous penetrations thru other substances and anomalous adhesion to other substances, generally resulting in backgrounds following mass spectroscopic measurements with major differences with the original backgrounds prior to said measurements.

VIII) Physical characteristics of the new species (specific weight, viscosity, etc.) and chemical features (thermochemical energy released or absorbed, chemical reactions, etc.) are generally different than those of the same substance without magnecules; and

IX) All the above anomalies disappear at a sufficiently high temperature (the Curie point of the new species) evidently varying from substance to substance.

Magnecules shall be called: elementary when composed by only two molecules; magneplexes when entirely composed by several identical molecule; and magnecusters when composed by several different molecules.

By denoting the conventional valence bond with the symbol \( - \) and the new magnetic bond with \( \times \), examples of elementary magnecules in gases and liquids are respectively given by

\[
\{ \text{H} - \text{H} \} \times \{ \text{H} - \text{H} \}, \{ \text{O} - \text{O} \} \times \{ \text{O} - \text{C} - \text{O} \}, \text{etc.}, \quad (2.1a)
\]

\[
\{ \text{C}_{15} - \text{H}_{20} - \text{O} \times \{ \text{C}_{15} - \text{H}_{20} - \text{O} \}, \text{ etc.}; \quad (2.1b)
\]

examples of magneplexes in gases and liquids are respectively given by

\[
\{ \text{H} - \text{H} \} \times \{ \text{H} - \text{H} \} \times \{ \text{H} - \text{H} \} \times \ldots, \text{ etc.}, \quad (2.2a)
\]

\[
\{ \text{H} - \text{O} - \text{H} \} \times \{ \text{H} - \text{O} - \text{H} \} \times \ldots, \text{ etc.}, \quad (2.2b)
\]

and examples of magnecusters are given by

\[
\{ \text{H} - \text{H} \} \times \{ \text{C} - \text{O} \} \times \{ \text{O} \} \times \{ \text{O} - \text{C} - \text{O} \} \times \{ \text{C} \} \times \ldots, \text{ etc.}, \quad (2.3a)
\]

\[
\{ \text{C}_{13} - \text{H}_{18} - \text{O} \} \times \{ \text{C}_{14} - \text{H}_{12} - \text{O}_{3} \} \times \{ \text{C}_{15} - \text{H}_{20} - \text{O} \} \times \ldots, \text{ etc.}, \quad (2.3b)
\]

In this paper I shall present the theoretical prediction of magnecules and a number of independent experimental verifications for their existence at the gaseous, liquid and solid states. A number of additional independent experimental
tests on magnecules are under way and they will be presented in future works.

2.2. The magnetic origin of the new bonds. It is evident that, as a necessary condition for their existence, any clusters of atoms and molecules requires a bonding force for their existence.

It is equally evident that the sole possible forces for new bonds are either of electric or of magnetic type. In fact, all available valence electrons are used in molecules by the very conception of the new species and, therefore, they cannot contribute to any new bond (which would be conventional anyhow). The weak and strong nuclear forces should be also dismissed because they are notoriously short range. This leaves the electric and magnetic structures of atoms and molecules as the only possible origin of the new bond.

It is equally evident that the electric origin of the new bond should be dismissed for any sufficiently strong and stable new species. To begin, the atoms and molecules constituting the new species are assumed to be neutral (Definition 2.1). As a consequence, the sole remaining possibility via electric fields is the electric polarization of atoms and molecules, e.g., that resulting from deformations of the electron orbits and/or displacements of the nuclei due to external fields.

It is equally evident that such a polarization is not sufficiently stable to characterize a stable new species. In any case, simple calculations (here left to the interested reader) establish that the numerical value of electric polarizations of atoms and molecules is too small to permit any appreciable new bond.

The above occurrence establish beyond scientific doubt that the only possibility for the new species to exist is that the new bonds are of magnetic type.

By continuing to proceed via exclusions, the only possible magnetic moments in a conventional atom or molecule are:

1) The intrinsic magnetic moments of the valence and other electrons;
2) The intrinsic magnetic moments of the nuclei; and
3) The magnetic moments caused by the rotation of the valence (and other) electrons in their orbits.

It is easy to see that the intrinsic magnetic moments of the electrons have no possible contribution to the new species. In fact, according to quantum chemistry, electrons have a density distributions in all three dimensions, thus preventing a localized value of their intrinsic magnetic moments.

Moreover, according to isochemistry, valence electrons couple themselves
into the singlet isoelectronia which have identically null magnetic moments by conception, Eq. (1.1).

It is equally evident that the intrinsic magnetic moments of nuclei cannot possibly contribute to the creation of a new species for various reasons, such as their insufficient strength as well as their excessive distance from other atoms (on an atomic scale).

At any rate, it is known that nuclei can be readily polarized with external magnetic fields, as established in the contemporary MRI technology [4]. In the event nuclear magnetic moments would be responsible for the new species, the mere application of a magnetic field to any liquid would imply its complete reduction to one single magnecluster in dramatic disagreement with experimental evidence.

In conclusion, the sole possibility for the existence of the new species is that their bonds originate from the magnetic moments of the orbits of valence electrons.

Various studies of clusters of atoms and molecules without detailed theoretical identifications and experimental verifications of the force responsible for their structure are rather customary in contemporary quantum chemistry, e.g., in the study of the so-called “fullerenes” [5]. This implies the possibility that the new species has already been encountered a number of times in this century, although not identified as such.

2.3. The magnetic polarization of the orbits of valence electrons

To my knowledge, the chemical literature of this century on magnetic fields has been restricted to the intrinsic magnetic moments of nuclei and electrons [4].

Despite a rather laborious search, I have been unable to identify any study on the magnetic moments of the orbits of electrons in the rather vast literature of both quantum mechanics and chemistry (the indication of pre-existing studies would be gratefully appreciated for proper quotation in future works).

The magnetic moments due to orbits of valence electrons have been generally forgotten throughout this century for good reasons. In their natural state at ordinary conditions of pressure and temperature, valence electrons of all atoms have a spherical distributions (Fig. 2.1A) in which case no magnetic moment associated to the orbits can possibly be detected.

However, quantum electrodynamics, establishes that the rotation of any electron in a p lone orbit does indeed create a magnetic moment according to well known laws (see next subsection).
FIGURE 2.1: A schematic view of the mechanism at the foundation of the new species, the polarization of the orbits of valence electrons in a plane (cyclotron resonance orbits) here
illustrated for the case of the hydrogen molecule. As it is well known, in its natural gas state at ordinary conditions of pressure and temperature, the hydrogen molecule is a sphere whose radius is equal to the diameter of a hydrogen atom (Case A). A main assumption of this paper is the existence of a technology based on external magnetic fields which eliminates the rotational motions, by reaching first the configuration of Case B and then that of Case C in which the orbit of the isoelectronium is polarized in a plane. The emergence of two well defined magnetic moments is then evident. Note that I assume no new feature of the atomic structure, and merely use the manifestation of an intrinsic feature of the atomic structure.

The fundamental hypothesis I submit in this paper is therefore that the orbit of the valence electrons can be polarized under sufficiently strong external magnetic fields, thus manifesting in this way their magnetic moment. The existence of the magnecules is a mere consequence.

As we shall see in the next subsection, the value of the magnetic moment of the polarized orbits of valence electrons is much bigger than the corresponding nuclear values. However, even ignoring such numerical value, a mere observation of the elementary magnecule (2.1) indicates the close proximity of the polarized orbits of different atoms. A stable magnecule is therefore expected even for smaller values of said magnetic moment due to the strength of magnetic attraction at small distances.

I should stress that the polarization of the orbit of the isoelectronium in a plane is studied in this paper only at absolute zero degree temperature and in the absence of rotations or other collective motions. It is evident that at ordinary temperature the application of external magnetic fields cannot produce polarization of the orbits in a plane, but only the deformation of the spherical distribution B of Fig. 2.1 into prolate spheroidal ellipsoids.

2.4. Theoretical representation of magnecules. By denoting with the arrow \( \uparrow \) the magnetic polarity North-South and with the arrow \( \downarrow \) the (vertical) polarity South-North, and by keeping the study at the absolute zero degree temperature, the main assumption of this paper is that the hydrogen molecule H–H can be polarized into such a form that the orbit of the isoelectronium is in a plane with resulting structure H\( \uparrow \)–H\( \downarrow \) (Fig 1.6).

Under this assumption, elementary magnecule (2.1) has the structure (see Fig. 2.2)

\[
\left( H_{\uparrow}^{a} - H_{\downarrow}^{b} \right) \times \left( H_{\uparrow}^{c} - H_{\downarrow}^{d} \right),
\]

(2.4)
where: a, b, c, d, are symbols merely denoting different atoms; the polarized hydrogen atom \( H_a \) is bonded magnetically to the polarized atom \( H_b \) with the South magnetic pole of atom a is bonded to the North pole of atom b; and the North polarity of atom c is bonded to the south polarity of atom d. This results in a strong bond due to the flat nature of the atoms, the corresponding mutual distance being very small and the magnetic force being consequently being large.

**FIGURE 2.3:** A schematic view of the most elementary possible gas magneucle (2.4), \( \{H_1-H_1\} + \{H_1-H_1\} \), here assumed to be formed at absolute zero degree temperature and in the absence of all collective motions. Note that the hydrogen molecule has no IR signature. Thus, the entire magneucle of this figure is therefore predicted to have no IR signature at all. Elementary magneucle (2.4) is therefore an exception to the general rule of Definition 2.1 according to which the only IR signatures of magneclusters are those of their molecular constituents. At ordinary temperature the magneucle acquires a conventional spherical shape due to rotations and other motions of the structure as a whole with comparatively ignorable relative motions between the two molecules.
Note that, once formed, magneucle (2.4) will indeed admit rotations, vibrations, and all conventional motions due to temperature, but as a single entity, with comparatively ignorable relative motions between the two molecules due to the strength of the bond.

A structure similar to (2.4) then holds for the remaining magneules (2.1)-(2.3). For example, another elementary gas magneucle is characterized by the polarizations

\[(H_u - H_u) \times (C_u - O_u);\]  

(2.5)

and a generic gas magnecluster then has the structure (see Fig. 2.3)

\[(H_u - H_u) \times (C_u - O_u) \times (H_u - O_u - H) \times (H_u - C_u - A - B - C \ldots) \times \ldots\]  

(2.6)

where A, B, C, are generic atoms in a conventional molecular chain and the atoms without an indicated magnetic polarity may indeed be polarized but are not necessarily bonded because of said geometric distribution in space.

Note that magneucle (2.4) may well have been detected several times in mass spectrometric measurements, but believed to be the helium (because its molecular weight is close to that of the helium). This case suggests that spectrometric studies of the new species should not be conducted unless the mass spectrometer (MS) is equipped with an infrared detector (IRD) for gases or ultraviolet detector (UVD) for liquids.

Recall that the hydrogen has no IR signature. Therefore, the IRD is expected to establish the lack of any IR signature of magneucle (2.4), while the helium has a well-defined and known IR signature. Lacking the IRD in the MS instrument one may end up in the "experimental belief" that the detected peak is that of the helium, while the scientific reality may be dramatically different.

In view of the above occurrence, in this analysis I shall, therefore, primarily use experimental evidence based on MS data complemented with IR data for gases or UV data for liquids, and consider as nonscientific possible MS dismissal of the new species with instruments without said IRD or UVD.

2.5. Numerical value of the magnetic moment of polarized electrons orbits. The calculation of the value of the magnetic moment of the orbits of the isoelectronium polarized in a fixed plane is truly elementary, but not
available in any book in quantum mechanics and chemistry I could inspect, as indicated earlier.

More specifically, the laws governing magnetic moments are well established in the literature. What is missing is their specific application to the orbits of the electrons beginning with that of the ground state of the hydrogen atom, let alone that for more complex atoms.

\[ \text{FIGURE 2.3: A schematic view of a generic magneucle (a magnecluster according to Definition 2.1) with constituent molecules in which only two dimers are magnetically bonded, while the remaining atoms of the molecules are not bonded due to their space geometry or other reasons.} \]

By using the rationalized systems of units, the magnetic moment \( M \) of a polarized orbit of the isoelectronium is given by the general quantum mechanical
law

$$M_{\text{isoel.}} = \frac{q}{2m} L \mu ,$$  \hspace{1cm} (2.7)

where \( L \) is the angular momentum, \( \mu \) is the rationalized unit and, from data (1.1), \( q = -2e \) and \( m = 2m_e \).

By plotting the various numerical values for the ground state of the isoelectronium in the hydrogen atom, I obtain

$$M_{\text{isoel.}} = 1.85.9590 \mu .$$  \hspace{1cm} (2.8)

By recalling that in the assumed units the proton has the magnetic moment 1.4107 \( \mu \), we have the ratio

$$\frac{M_{\text{isoel.}}}{M_{\text{proton}}} = \frac{1.856.9590}{1.4107} = 1.316.3387 ,$$  \hspace{1cm} (2.9)

namely, the magnetic moment of the polarized orbit of the isoelectronium in its ground state for the hydrogen atom is 1.316 times bigger than the magnetic moment of the nucleus (the proton).

Due to its large numerical value, result (2.9) is amply sufficient to provide the theoretical foundations for the existence of the new chemical species of magnecules.

Recall from Paper II that the ground state of the isoelectronium in the hydrogen atom is different than that of the electron. Despite that, the two magnetic moment coincide.

In fact, angular momenta have the structure \( r \wedge p \); the orbit of the isoelectronium is expected to be \( 1/4 \) that of the electron, while its linear momentum is double in value. By plotting these data in Eq. (2.7) it follows that the magnetic moment of the isoelectronium in its ground state polarized orbit for the hydrogen molecule as per Eq. (2.7) coincides with the magnetic moment of the ordinary electron in its own ground state in the same hydrogen atom, besides the presence in the latter case of the intrinsic magnetic moment of the electron (which must evidently follow the same polarization of the orbit).

It then follows that the conventional model of the hydrogen molecule implies a total value of the magnetic moment for the polarized ground state
electron orbit in the hydrogen atom much bigger than the corresponding value for the isochemical model of the same molecule, due to the additional presence of the intrinsic magnetic moment of the electron.

In short, the conventional quantum chemical model of molecular bonds would predict a bigger magnetic bond than that predicted by hadronic chemistry. Nevertheless, this prediction will not be considered in this study due to the inconsistencies of quantum chemistry identified in Sect. 1.

Due to the conceptual, theoretical and experimental implications of Value (2.9), its independent verifications of its are solicited.

3. EXPERIMENTAL EVIDENCE OF MAGNECULES IN GASES AT TOUPS TECHNOLOGY CORPORATION.

3.1. Creation of magneecules in gases. I first proposed the existence of magneecules to, and several independent experimental verifications have been first established at the U. S. public corporation TOUPS TECHNOLOGY LICENSING (TTL) of Largo Florida (see the Company's Web Site [6a]). This section is devoted to an outline these developments.

During my studies on hadronic mechanics, I predicted the formation of magneecules in gases exposed to intense magnetic fields. I therefore searched for specific cases in which these conditions are met.

It was easy to see that one of the strongest, readily available sources of magnetic fields in gases is an electric discharge. I therefore predicted that magneecules exist in gases created by an electric discharge which are generally combustible. A similar prediction holds for liquids, as we shall see in Sect. 4.

I use the generic name of MagneGas to denote combustible gases created under or treated via a magnetic field sufficient to produce detectable magneecules. I use the term MagneFuel (or MagFuel for short) to include liquids with the same characteristics. Some of the MagneGases known to me are:

A) The gas patented by I. Eldridge in 1898 [7a];
B) The gas patented by W. A. Dammann and D. Wallman also in 1995 [7db];
C) The gas patented by W. J. Richardson, Jr., in 1995 [7c] called AquaFuel\textsuperscript{TM};
D) The so-called Brown gas [7d];
E) The SkyGas [7e];
and others.

In general, an electric discharge is in a liquid essentially consisting of tap
water, carbon and other soluble substances, decomposes the water and other substances by forming a plasma at about 5,000 °C of mostly ionized atoms of hydrogen, oxygen, carbon and possibly other elements which combine in a variety of ways, forming nonexplosive combustible gases with clean emission exhausts. The new gases cool down in the surrounding water, and bubble to the surface where they are collected with various means.

The main hypothesis I formulated in early 1998 is that at the time of their formation, gases H₂, CO, CO₂, O₂, etc. do not have a conventional structure because the orbits of (at least) their valence electrons are polarized (cyclotron resonance orbit) due to the very intense magnetic field surrounding the discharge (of the order of 10 Tesla). In turn, such a polarization implies the creation of the strong magnetic moments of Sect. 2.5, resulting a new magnetic bonds constituting the magneules as per Definition 2.1.

While conducting these studies, I had the opportunity of visiting in early 1998 TTL where I met Mr. Leon Toups, President, Mr. Mark Clancy, Mr. Michael Toups and Mr. Jerry Kammerer, Vice Presidents, Mr. William H. Richardson, jr., Mr. Ken Lindfors, Mr. Jack Hansen and other TTL engineers.

In this way I had the opportunity of seeing the production of AquaFuel, a new, safe, clean, combustible gas under development by TTL, which is produced quite simply via an electric discharge on carbon rods within ordinary tap water.

It was evident that the electric discharge decomposes the carbon rod, and creates a high temperature plasma of mostly ionized atoms of hydrogen, oxygen and carbon. In view of their affinity, carbon combines with virtually all available oxygen, thus resulting in a nonexplosive combustible gas, essentially composed by magnetically polarized molecules H₂, CO, CO₂ and their magnetic bonds. The resulting gas has some of the cleanest exhausts available in the fuel industry (see Web Site [6b] for details).

Immediately following my visual inspection of AquaFuel, I indicated to Mr. Leon Toups and other TTL members the hypothesis that the chemical structure of AquaFuel is anomalous, that is, not representable with quantum chemistry. This hypothesis was fully supported by Mr. W. Richardson, jr., because of his years of unsuccessful and frustrating attempts in trying to understand AquaFuel via conventional chemical analyses and related quantum chemistry.

In fact, several conventional mass spectrometric analyses on AquaFuel conducted at conventional high temperatures, after adjustments due to possible air contamination (indicated by nitrogen content) and averaging over various methods of production, suggested the following
Conventional chemical composition of AquaFuel:

\[
\begin{align*}
\text{H}_2 & \quad 50 \% \\
\text{CO} & \quad 40 \% \\
\text{CO}_2 & \quad 9 \% \\
\text{O}_2 & \quad 0.2 \% \\
\text{Misc. struct. in ppm} & \quad 0.8 \% \\
\end{align*}
\]  

However, the above chemical analysis was in dramatic disagreement with a variety of experimental evidence on AquaFuel reported in detail in Web Site [6b], such as: irreconcilable difference between the energy content of AquaFuel predicted by chemical composition (3.1) and the experimental evidence (see also Sect. 3.4); existence of large clusters in AquaFuel following filtration of light gases; numbers of octanes; and others.

I therefore conjectures that AquaFuel is indeed composed by the gases according to analysis (3.1), but all of them are magnetically polarized due to the high magnetic field of the electric discharges that produces them, thus resulting in a new chemical structure with generic magneicles

\[
\begin{align*}
(H_2 - H_2) \times (H_2 - H_2), & \quad (C_1 - O_1) \times (C_1 - O_1), \quad (O_1 - O_1) \times (O_1 - O_1), \text{ etc.}, \\
(H_2 - H_2) \times (H_2 - H_2) \times (H_2 - H_2), & \quad (C_1 - O_1) \times (C_1 - O_1) \times (C_1 - O_1) \times \ldots, \text{ etc.}, \\
(H_2 - H_2) \times (C_1 - O_1) \times C_1 \times (O_1 - O_1) \times O_1 \times (C_1 - O_1) \times C_1 \times \ldots, \text{ etc.},
\end{align*}
\]  

where one should note the expected presence of individual polarized atoms, besides polarized molecules.

I therefore recommended to TTL the conduction on AquaFuel of comprehensive scientific measurements, such as those via suitably supervised Gas Chromatographic Mass Spectroscopic (GC-MS) equipment; energy content; octanes; permeability; etc. All these measurements were expected to be anomalous, thus providing the foundations of possible new technology on magnetically polarized gases of possible direct industrial relevance for TTL.

Mr. Leon Toups and all other TTL officers and members provided all possible financial, technical and logistic assistance for the conduction of the proposed scientific measurements which resulted to be invaluable for the achievement of the results presented in this study.

One should note the corporate origin of the above support for the search of basically new scientific knowledge, that is, knowledge beyond pre-existing
doctrines, which acquires particular significance when considering the notorious impossibility of seeking basic new knowledge in the contemporary academic environment.

In this section I report the experimental verifications on the existence of magneucules in AquaFuel achieved thanks to TTL support. Additional experimental verifications are under way at this writing and they will be reported in future papers.

3.2. Anomalies of magneucules to be measured. The hypothesis of magneucules in gases implies the expectation of numerous anomalies in various fields (mass spectrometry, thermochemical behavior, physical characteristics, etc.), such as:

Anomaly 3.1: Appearance of unexpected heavy MS peaks.

Gas magneucules are generally heavier than the heaviest molecule in a given gas. Peaks in the GC-MS are therefore expected in macroscopic percentages with molecular weights bigger than the heaviest molecule. These heavy composites should not provide MS peaks according to quantum chemistry, thus constituting an anomaly. As an illustration, the heaviest AquaFuel molecule in macroscopic percentages is CO₂, eq. (3.1), which has molecular weight 44 a.m.u. By ignoring heavy compounds in parts per million (ppm), AquaFuel should have no large peak in the GC-MS with more than 44 a.m.u. The existence of heavier large peaks would establish this first anomaly.

Anomaly 3.2: “Unknown” character of the unexpected peaks.

To provide the initial premises for magneucules, the peaks of Anomaly 3.1 should result be “unknown” in the search by the GC-MS computer in its memory banks of conventional molecules, usually including about 150,000 molecules.

Anomaly 3.3: Lack of IR signature of the “unknown” peaks.

Another necessary condition to have magneucules is that the “unknown” peaks of Anomaly 3.1 should have no infrared signature at all. According to established evidence, all gases with a valence bond must have a well defined infrared signature (with a few exception of spherically symmetric molecules such as H₂). In the event the peaks of Anomaly 3.1 do have such a signature, they can be constituted by new yet conventional molecules not identified before. The only infrared signatures of any given gas magneucle should be those of the conventional molecules and atoms constituting the cluster itself. As an illustration, the only admissible infrared signatures of magneucle \((O\uparrow-O\downarrow)\times(C\uparrow-O\downarrow)\) are those of the conventional molecules O=O and C=O.
Anomaly 3.4: Mutation of conventional IR signatures.

The infrared signatures of the molecules constituting a magneules are expected to be mutated, in the sense that the shape of their peaks is not the established one. This is another necessary condition for the existence of magneules requested by the polarization of the orbits of the valence electrons. In fact, this polarization implies space distributions of the orbitals different than the conventional ones, thus resulting in a deformation of the shape of the IR peaks. Moreover, the same polarizations are expected to create additional strong bonds within a conventional molecule, which are expected to appear as new IR peaks. Still in turn, such an internal mutation of conventional molecules as far reaching scientific and technological implications, as we shall see.

Anomaly 3.5: Mutation of magneules.

While molecules preserve their structure at conventional temperatures and pressures, this is not the case for magneules which are expected to mutate in time, that is, to change the shape of the MS peaks due to change in their constituents. Since we are referring to gases whose constituents notoriously collide, magneules can break-down during collisions into parts which can then recombine with other magneules to form new structures. Alternatively, magneules are expected to experience accretion (or emission) of polarized conventional atoms or molecules without necessarily breaking down into parts. It then follows that the peaks of Anomaly 3.1 are not expected to remain the same over a sufficient period of time for the same gas under the same conditions.

Anomaly 3.6: Mutated physical characteristics.

Magnetically polarized gases are expected to have mutated physical characteristics because the very notion of polarization of the orbits implies a smaller average molecular volume. Mutation of other physical characteristics is then consequential.

Anomaly 3.7: Increased adhesion.

Magnetically polarized gases are expected to have a increased adhesion to walls of disparate nature as compared to the same unpolarized gas. This is due to the well known property that magnetism can be propagated by induction according to which a magnetically polarized molecule with a sufficiently intense magnetic moment can induce a corresponding polarization of valence (and/or other) electrons in the atoms or molecules constituting the walls surface. Once such a polarization is created by induction, magneules can have rather strong magnetic bonds to said walls.

Anomaly 3.8: Increased penetration through substances.

Magnetically polarized gases are expected to have absorption or penetration through other substances. This is first due to the reduction of the average
molecular volume with inherent increase of permeability as compared to the same unpolarized gas. The second reason is the magnetic induction of the preceding anomaly.

**Anomaly 3.9: Increased energy release.**

Magnetically polarized gases are expected to have thermochemical reactions with macroscopic increases of energy releases as compared to the same reactions among unpolarized gases, an expected anomaly which, alone, has large scientific and industrial significance.

*All the above anomalies are expected to disappear at a sufficient high temperature, evidently varying from gas to gas (Curie point), while the anomalies are expected to be enhanced at lower temperature and survive liquefaction.*

Thanks to the invaluable financial, technical and logistic support by Mr. Leon Toups, TTL President, my main task in 1998 has been that of providing scientific evidence by independent laboratories for the above anomalies.

The task has been rendered difficult by the fact that most conventional analytic equipment and methods have been developed for *conventional* properties. As such, they are expected to be ineffective for the measurements of *anomalous* properties.

Evidently, Anomalies 3.1 through 3.6 should be established via GC-MS. However, most GC-MS machines are not suitable to detect magnecules, and the few that are suitable should be operated in a way significantly different than the conventional one (otherwise the magnecules would have been discovered long ago).

More specifically, the *necessary conditions for measurements of magnecules with gas chromatographic, mass spectroscopic equipment are the following:*

**Condition 3.1:** The GC-MS should permit measurements of peaks at ordinary temperature (say, 10 C - 30 C) and the feeding lines should be cryogenically cooled. By comparison, GC-MS are routinely operated at temperatures of the order of 150 C to 230 C for which no magnecule is expected to exist. To put it explicitly, the conventional operation of GC-MS destroys the very clusters to be detected, and this identifies a first reason for the lack of detection of magnecules until now.

**Condition 3.2:** GC-MS used for measurements of magnecules should be equipped with the InfraRed Detector (IRD). In its absence,
no scientific measurement should be considered as final (because of the lack of 50% of the necessary measurements). To put this important point in plain language, measurements of magnetically polarized gases without the IRD can likely provide "experimental beliefs" without real scientific value due to "conventional interpretations" which are permitted precisely by the absence of IR data. On the contrary, data indicating the absence of IR signature for a given peak at the MS would discredit such "conventional interpretations" as nonscientific because, as indicated earlier, conventional molecules have an IR signature with only a few exception. Following a laborious search, I discovered that virtually all GC-MS in academic laboratories are not equipped with IRD (because academicians assume to be able to identify substances from their MS data only). This second main requirement virtually rules out the use of GC-MS in academic laboratories for the detection of the new species, and provides an additional reason why the magneules have not been detected in academic laboratories so far. In reality, as we shall see, numerous magneules have been indeed detected in academic laboratories, but were misinterpreted as esoteric molecules precisely because of the lack of IRD.

**Condition 3.3:** The GC-MS/IRD should be equipped with the largest possible feeding line with at least 0.5 mm ID. By comparison, GC-MS are usually operated with feeding lines with the smallest possible ID, at times of the order of 0.1 mm. This additional unusual requirement is due to Anomaly 3.7, i.e., the enhanced adhesion of magneules to the walls of the feeding line which, in this way, becomes clogged up to the point of preventing the passage of the most interesting magneules, the big magneclusters (Definition 2.1). This is another condition analysts with extended practice on conventional gases can only accept after being exposed to the evidence. The requirement is due to the fact that magneules have the tendency to aggregate themselves in large clusters, some of which are so big to be visible to the naked eye (particularly in liquids, as shown in the next section). The use of the smallest possible feeding line, while fully acceptable for conventional gases, generally prevents the most interesting magneules to even enter the instrument, let alone to be detected.

**Condition 3.4:** The GC-MS should be set to detect peaks at molecular weights where the analyst usually expects none. This condition identifies another reason why magneules have simply not been looked for until now. As an illustration, the most interesting molecular weights for AquaFuel are those bigger than their heaviest conventional molecule, i.e., bigger than 44 a.m.u. It goes without saying that smaller molecular weights are also
important once the analyst *seeks an anomaly*, rather than a conventional setting. In fact, one of the most important magnecules is structure (2.4) at about 4 a.m.u composed by two hydrogen molecules.

**Condition 3.5: The ramp time should be the longest admitted by the GC-MS/IRD and of at least 25 minutes.** In general, for the evident reason to reduce costs, the ramp time is set at the smallest possible operational value, which is perfectly acceptable for conventional gases, but substantially inappropriate for the anomalies we have to detect. As we shall soon see, for the case of magnetically polarized gases a small ramp time implies the clustering of all magnecules into one single peak. The analyst then looks at each individual constituent of such a unique large peak and find fully conventional molecules, thus reaching the "experimental belief" of facing a conventional molecular structure. For a sufficiently large ramp time the magnecules are instead well separated, thus permitting the analyst to see their individual existence and therefore establish their individual lack of the valence structure via MS and IR data.

Numerous other conditions exist for GC-MS/IRD to be effective in the detection and identification of magnecules. They are of more technical nature and will be indicated whenever needed.

Besides the problems in identifying an appropriate GC-MS/IRD, I experienced additional difficulties in the identification of other instruments capable of providing effective measurements of the other Anomalies 37.3.3.9, again, because the available instruments have been designed for the measurement of conventional rather than anomalous features.

As an illustration, by far the most difficult measurement of AquaFuel features has been the achievement of credible scientific values of its energy content in British Thermal Units (BTU) per cubic foot (cf). By comparison, the measurement of the BTU/cf of ordinary gases is so elementary nowadays to be computerized following GC-MS data.

Significantly, all methods currently available to measure the BTU/CF of AquaFuel failed to provide results of any credibility (this is the case of computerized computation of BTU/cf from GC-MS results) and some conventional calorimeters did not even allow AquaFuel to burn, let alone to make a measurement (this is the case of the computerized calorimeters for methane whose air intake is too big for the combustion of AquaFuel and its required adjustment outside the range of the computer program).

Equal difficulties were encountered via the use of EPA analytic techniques,
evidently because they are not designed to detect anomalies.

3.3. Spectroscopic evidence of magnecules in gases. After a laborious search in the U.S.A., I located a GC-MS equipped with IRD suitable to measure magnecusters at the McClellan Air Force Base in North Highland, near Sacramento, California. Thanks to the invaluable assistance and backing by TTL, I was authorized to conduct GC-MS/IRD measurement on AquaFuel at that facility.

Following the prior arrival of a bottle of AquaFuel, on June 19, 1998, I visited the analytic laboratory of NATIONAL TECHNICAL SYSTEMS (NTS) located at said McClellan Air Force Base. The measurements on AquaFuel were conducted by analysts Louis A. Dee, Branch Manager, and Norman Wade who operated an HP GC model 5890, an HP MS model 5972, and an HP IRD model 5965. Upon inspection, the instrument meet all conditions 1-5 of Sect. 3.2. I therefore authorized the measurements.

Thanks to a professional cooperation by the analysts, the equipment was set at all the usual conditions indicated in Sects. 3.2. In particular, the equipment was set for the analytic method VOC IRMS.M utilizing an HP Ultra 2 column 25 m long with a 0.32 mm ID and a film thickness of 0.52μm. I also requested to conduct the analysis from 40 a.m.u. to the instrument limit of 500 a.m.u. This condition was necessary to avoid the CO peak of AquaFuel at 28 a.m.u. which is so large to dwarf all other peaks.

Moreover, the equipment was set at the lowest possible temperature of 10 C; the biggest possible feeding line with an ID of .5 mm was installed; the feeding line itself was cryogenically cooled; the equipment was set at the longest possible ramp time of 26 minutes; and a linear flow velocity of 50 cm/sec was selected. A number of other technical requirements are available in the complete documentation of the measurements reproduced in App. A of Ref. [3e].

The analysts first secured a documentation of the background of the instrument prior to any injection of AquaFuel in view of Anomaly 3.7 which is evidently expected to alter the background due to anomalous residues of the AquaFuel in the instrument after the completion of the tests.

Following a final control that all requested conditions were in place, NTS analysts Louis A. Dee and Norman Wade injected AquaFuel into the HP GC-MS/IRD and initiated the tests.

As one can see, the results constitute the first direct experimental evidence on the existence of magnecules.

After waiting for the 26 minutes of the ramp time, sixteen heavy anomalous
peaks appeared in the MS screen, thus providing direct experimental verification of Anomaly 3.1 (Fig. 3.1).

AquaFuel contains from 5% to 7% of CO₂ as per various chemical analyses conducted at high temperature [6b]. The spectrum of Fig. 3.1 is from 40 a.m.u. to 500 a.m.u. Comparative inspection of the various peaks and their size then establishes that they represent macroscopic percentages of compounds in AquaFuel which, according to quantum chemistry, should not exist, thus providing experimental evidence for Anomaly 3.1 beyond scientific doubt.

I should report that, at the appearance of the peaks of Fig. 3.1, analyst Norman Wade stated "I have not seen something like these peaks in twenty-five years of analyses".

The analysts then passed to the identification of the individual peaks of Fig. 3.1. As illustrated in Fig. 3.2 (see the complete documentation of Ref. [3c] for more data), all sixteen peaks of Fig. 3.1 resulted to be "unknown" following the computer search in the memory banks of the McClellan Air Force Base comprising about 140,000 molecules, thus providing direct experimental verification of Anomaly 3.2.

After completing and documenting the MS data, the analysts passed to measurements at the IRD. To their surprise, none of the peaks of Fig. 3.1 had any infrared signature at all, thus providing direct experimental verification of Anomaly 3.3 (Fig. 3.3). The IR scan for the MS peaks of Fig. 3.1 only shows a peak clearly belonging to CO₂, namely, to one of the components of the peaks of Fig. 3.1. The IR signature of the other components do not appear in Fig. 3.3 because they are behind the left margin of the scan. Note also that there is no identifiable CO₂ peak in the MS spectrum of Fig. 3.1.

The analysts then established (Fig. 3.4) that the IR peak of CO₂ is itself anomalous (mutated), thus providing experimental evidence for Anomaly 3.4.

This result is most intriguing inasmuch as it provides experimental evidence for a mutation of the structure of conventional molecules with the presence of an additional strong internal binding force also expected to be of magnetic type which, in turn, is expected to imply an increased energy content.

To appraise the implication of this aspect alone, one should meditate a moment on the fact that it provides experimental evidence on the polarization of the orbits of internal non-valence electrons, evidently because valence electrons cannot provide any additional molecular bond for both conventional and hadronic chemistry.

The analysts also inspected small peaks in the IR scan, and they all resulted to be "unknown", as shown in Fig. 3.5, thus completing the experimental evidence
of the anomalous IR behavior.

Following the measurements, I received the following signed report dated June 23, 1998 (see the original in App. I of Ref. [3f]):

"Dear Dr. Santilli,

Thank you for the opportunity to provide analytic data on AquaFuel™. Attached are all GC-MS and concomitant GC-IR data that we obtained for the unfiltered sample.

... Our blank runs obtained before and after the analyses show no high mass spectra, thus proving that the high molecular weight species found were actually in the AquaFuel™ sample.

.... Search results using a library of 138,000 chemical compounds, did not indicate any matches with this high molecular weight species found in AquaFuel™.

Based on the limitations of our equipment and our inability to find a library match, the identification of this mysterious AquaFuel™ ingredient is an unknown."

National Technical Systems
Louis A. Dee
Branch Manager"
FIGURE 3.1: A reproduction of the MS peaks providing the first experimental evidence on the existence of magnecales identified on June 19, 1998, by analysts Louis A. Dee and Norman Wade of the branch of NATIONAL TECHNICAL SYSTEMS (NTS) located at the MCCLELLAN AIR FORCE BASE in North Highland, near Sacramento, California, under support from TOUPS TECHNOLOGY LICENSING (TTL) of Largo, Florida. The peaks refer to the combustible gas AquaFuel™ under development by TTL, for molecular weights ranging from 40 a.m.u. to 500 a.m.u. AquaFuel is a light gas with only
CO\textsubscript{2} as the heaviest molecule in macroscopic percentage with a molecular weight over 40 a.m.u. [6]. Therefore, only the CO\textsubscript{2} peak should have appeared in the scan with any macroscopic size. On the contrary, the CO\textsubscript{2} peak is not identifiable at all in the scan; all sixteen peaks should not be present according to quantum chemistry; and the scan therefore provides the first direct experimental confirmation of Anomaly 3.1.

Library Searched: C:\DATABASE\WILEY138.L
Quality: 37
ID: Tris(methylseleno)(13C)methane

**FIGURE 3.2.** The first experimental evidence at NTS that the peaks of Fig. 3.1 are "unknown". The peak at the top is that at 8.924 minutes and that at the bottom shows the lack of its identification by the computer search. Note that, not only the best fit identified by the computer does not match the peak considered, but also the identified
substance (methylseleno) cannot possibly exist in AquaFuel because of the impossible presence of the necessary elements. Exactly the same situation holds for all remaining fifteen peaks of Fig. 3.1 (see the complete documentation in Ref. [36]) which, therefore, remained "unknown", thus providing the first direct experimental verification of Anomaly 3.2.

FIGURE 3.3: The first experimental evidence at NTS on the lack of IR signature of molecules, which establishes the existence of large peaks in the MS which have no IR signature at all. This provided the first direct experimental verification of Anomaly 3.3. The only IR signatures which are possible in AquaFuel are those for the constituents of the peaks of Fig. 3.1 which are ordinary gases such as O₂, CO, and CO₂. In the above figure only the IR signature of CO₂ appears because the scan was from 40 a.m.u. to 500 a.m.u. and, as such, could not include the IR signatures for O₂ and CO (H₂ has no IR signature).
FIGURE 3.4: *The first experimental evidence at NTS on the mutation of the IR signature of magnetically polarized conventional molecules, here referring to the CO$_2$ (top) compared to the conventional one (bottom). This provides the first direct experimental verification of Anomaly 3.4, namely, that conventional molecules composing AquaFuel have a deformed space distribution of their electrons, as necessary to have a polarization of their orbits. In turn, such deformations imply a necessary mutation of the IR signature. Note that the known, double-lobe PQR peak of CO$_2$ persists in the detected peak with the correct energy, and only with decreased intensity. Jointly, there is the appearance of a new peak at higher energies on the left which is*
Jointly, there is the appearance of a new peak at higher energies on the left which is evidence of an extremely interesting new internal bond within the conventional CO$_2$ molecule, which evidently implies an increased energy content, thus establishing experimental foundations for a new technology of magnetically polarized gases with enhanced energy content (see Sect. 3.4). Note that the computer interprets the IR signature as belonging to CO which is erroneous since CO is out of the selected range. The signature is instead that of CO$_2$ as confirmed in subsequent tests (see Fig. 3.8).

**FIGURE 3.5**: A reproduction of the lack of identification in the computer search of small peaks in the IR scan. The best possible match offered by the computer (lower peak) does not even partially recover the detected IR peak (top). At any rate, the suggested substance (Acetamide) cannot possibly exist in AquaFuel because of the lack of the necessary elements. All other smaller IR peaks remained equally unknown.
The measurements on the same sample of AquaFuel tested at NTS were repeated on July 25, 1998, by analyst Kevin Lothridge via a GC-MS/IRD located at the PINELLA S COUNTY FORENSIC LABORATORY (PCFL) of Largo, Florida, under TTL support (for complete documentation see App. II of Ref. [3f]).

The equipment consisted of an HP GC model 5990 Series II, an HP MS model 5970 and an HP IRD model 5965B. Even though similar to the equipment used at NTS, the PCFL equipment was significantly different inasmuch as the temperature had to be increased from 10 C to 55 C and the ramp time reduced from 26 minutes to 1 minute. The latter reduction implied the cramping of all peaks of Figure 3.1 into one single large peak, a feature confirmed by all subsequent GC-MS tests with short ramp time.

Despite these differences, the test at PCFL confirmed all Anomalies 3.1-3.4 first detected at NTS (see Figs. 3.6, 3.7, 3.8 and the complete documentation reproduced in Appendix B of Ref. [3e]). In addition, the tests provided the first experimental evidence of additional anomalies.

Following my request, analyst Kevin Lothridge conducted two MS tests of the same AquaFuel sample at different times about 30 minutes apart. As one can see in Fig. 3.9, the test at PCFL provided the first experimental evidence of Anomaly 3.5, the mutation in time of magneules. In fact, the peak of Fig. 3.9 is macroscopically different than that of Fig. 3.6.

This provided evidence that, when colliding, magneules can break down into ordinary molecules, atoms and fragments of magneclusters, which then recombine with other molecules, atoms and/or magneules to form new unknown peaks. Equivalently, the experimental evidence establishes the expectation that mutation of magneules can simply occur via the accretion of release of another polarized atoms or molecule without breaking down.

As one can see in Fig. 3.10, the tests conducted by analys: Kevin Lothridge also provided the first experimental evidence that the background following the end of the measurements resulted to be significantly similar to the MS scan, thus providing a direct experimental verification of Anomaly 3.7 on the increased adhesion of magneules.

The original background prior to the measurements with AquaFuel was re-obtained only after flushing the instrument with an inert gas at about 250 C. Such flushing heated the interior walls and parts of the instrument, thus breaking down all magneules, terminating their anomalous adhesion and re-establishing their conventional molecular structure.
FIGURE 3.6. A view of the IRD scan (top) and MS spectrum (below) of AquaFuel conducted by analyst Kevin Lothridge on July 25, 1998, via a HP GC-MS/IRD located at the Pinellas County Forensic Laboratory (PCFL) of Largo, Florida, under support from TOURS Technology Licensing (TTL) also of Largo, Florida. As one can see, the scan confirms the anomalous peaks of Fig. 3.1 obtained at NTS which are clustered into
the single peak (bottom part of the above figure) due to the excessively short ramp time of 1 minute. The scan also confirms the results of Fig. 3.3 obtained by NTS on a crucial anomaly of magneules, their lack of IR signature (top part of the figure). Note that, exactly as it was the case for the NTS IR signature, the only IR signature is that of CO₂ which does not appear in the MS scan as an isolated identifiable peak even though it is contained in AquaFuel for about 9%.

**FIGURE 3.7:** A confirmation at the PCFL of the NTS result of Fig. 3.2, the lack of identification by the computer search of the peaks in the MS (see App. II of Ref. [3f] for the complete documentation). Again, the substance selected by the computer as the best match (bottom) does not even approach the detected peak (top), besides being impossible for AquaFuel because of the lack of needed elements.
FIGURE 3.8: The independent confirmation at the PCFL of the NTS finding of Fig. 3.4 regarding the mutated IR signature of the CO$_2$ in AquaFuel. Note the almost identical shape of the mutated IR peak in the top of the above figure and that in Fig. 3.4. Note the shift toward lower energies of the mutated signature as compared to that of Fig. 3.4. This implies a weakening of the conventional valence bond in the CO$_2$ structure (expressed by the double-lobe peak) in favor of magnetic bonds due to the polarization of the orbits of internal electrons, thus confirming the capability of magnetically polarized molecules to store more energy than the conventional ones.
FIGURE 3.9: The first direct experimental verification of Anomaly 3.5 obtained by analyst Kevin Lothridge at the PCFL on July 25, 1998, on the mutation in time of the magneules constituting AquaFuel. The MS peak of this figure is macroscopically different than that of Fig. 3.6, despite the fact that they refer to the same gas (without even removing the bottle from the feeding line), only scanned 30 minutes apart.
FIGURE 3.10: The first direct experimental verification of Anomaly 3.7 obtained at the PCFL, the increased adhesion of magnetules. The figure reproduces the background of the instrument upon completion of the measurements and removal of AquaFuel. Nevertheless, the background results to be very similar to the MS scan during the tests, thus establishing that part of the gas had remained in the interior of the instrument. This behavior can only
be explained via the induced magnetic polarization of the atoms and molecules in the walls and parts of the instrument with consequential increased adhesion via magnetic bonds. It should be noted that this anomalous adhesion has been confirmed by all subsequent tests for both the gaseous and liquid states.

A third independent verification was conducted on July 29, 1998, by analyst David Fries at the CENTER FOR OCEAN TECHNOLOGY of the UNIVERSITY OF SOUTH FLORIDA (USF) in St. Petersburg, under TTL support. The test were done via the use of a GC-MS Barian 2000 in which the GGC had been removed and replaced by a modified Paul's Trap which turned the instrument into a Ion Trap Mass Spectrometer (IT-MS).

Since the equipment belongs to an academic laboratory, it was not equipped with an IRD. This is unfortunate for scientific knowledge because Paul's Trap is based on a locally strong magnetic field which, as such, is expected to polarize all conventional molecules (although in an amount evidently less than the extreme magnetic fields of a large electric discharge).

In fact, the background of the instrument prior to the initiation of measurements showed various peaks which were tentatively identified as conventional molecules. The presence of an IRD would have evidently permitted the separation of science from personal beliefs.

In fact, only the additional presence and use of an IRD would have permitted the scientific identification with only two possibilities: the IR signatures of the peaks in the background are indeed those of the believed conventional molecules; or said peaks have no IR signature at all, in which case they cannot possibly be conventional molecules, because consisting of smaller molecules under the new magnetic bond.

As one can see in the following figure 3.11-3.21 (see Appendix III of Ref. [3f] for the complete documentation), despite the lack of IRD, the measurements provided a third independent verification of all preceding experimental evidence on the existence of magneules.

Moreover, the USF measurements established the existence in the AquaFuel magneules of individual hydrogen atoms, due to the accretion or loss by various peaks of only one hydrogen atom due to variations of only one a.m.u. This result was expected because of the known high sensitivity of Paul's Trap. The presence in the AquaFuel magneules of other individual atoms (such as C or O) is implies in the preceding NTS and PCFL measurements, although it is best established for the case of the hydrogen.

In view of the above occurrence, inspection of the various MS scans
indicates the absence in molecules of systematic numerical periodicities, e.g., their systematic increase with periodicity two (sole accretion of \( \text{H}_2 \) molecules), or thirty-eight (sole accretion of \( \text{CO} \) molecules).

FIGURE 3.11: Scan 79 of the tests conducted on AquaFuel on July 29, 1998, by analyst David Fries at the CENTER FOR OCEAN TECHNOLOGIES of the UNIVERSITY OF SOUTH FLORIDA (USF) in St. Petersburg, under support by TOUPS TECHNOLOGY LICENSING (TTL) of Largo, Florida. A mere visual inspection of the peaks provides additional direct experimental verifications of Anomaly 3.1 as first established by the NTS data of in Fig. 3.1.
AquaFuel is a light gas with about 49% H₂, 40% CO, 9% CO₂, 1% of O₂, and 1% of traces of various heavier substances based on H, O and C individually in ppm. The very existence of the dominant large peak at 73 a.m.u. is unequivocal experimental confirmation of Anomaly 3.1. The large peaks at 246, 325, 341, 356 and 429 a.m.u. then confirm the above evidence beyond credible doubt. Needless to say, there are countless conventional substances having 73 a.m.u., but none of them is possible in a gas composed by H, O and C and created at about 5,000 C of the electric discharge.

FIGURE 3.12. A reproduction of scan 428 at USF. Note the dramatic differences with the preceding scan 79 of Fig. 3.11 which confirm the mutation the magnecules. Note also the lack of systematic numerical periodicity in the mutations which are, therefore, at random, as expected from the internal collisions in a gas.
FIGURE 3.13: A reproduction of scan 462 of the USF measurements on AquaFuel which confirms the mutation of mageneules in time. Note the decrease of the main peak from 77 a.m.u. of the preceding figure to 73 a.m.u. of this figure. Comparison of the two scans also identifies the mutations 202 → 201, 282 → 281, 356 → 355 which provide the first
direct experimental verification of the presence in magneules of individual hydrogen atoms. Moreover, the mutation of the main peak 77 → 73 provides the first experimental evidence of the existence of the elementary magneule \( \text{H}_{1} \rightarrow \text{H}_{2} \times \{ \text{H}_{3} - \text{H}_{4} \} \). In fact, AquaFuel contains helium only in ppm. Mutation 77 → 73 of the dominant peak cannot, therefore, be credibly explained via the loss of a helium atom.

FIGURE 3.14: A reproduction of scan 1881 of the USF measurements on AquaFuel.
FIGURE 3.15: The lack of identification of the peak of scan 1881. Note that the computer provides 100% confidence on substances that cannot possibly exist in AquaFuel because of the lack of existence in AquaFuel of the necessary elements.
FIGURE 3.16: The lack of identification of the peak in scan 1108.
FIGURE 3.17: The lack of identification of the peak in scan 1764.
FIGURE 3.18: The lack of identification of the peak in scan 1068.
FIGURE 3.19: The lack of identification of the peak in scan 1089.
FIGURE 3.20: The lack of identification of the peak in scan 1105.
FIGURE 3.21: The lack of identification of the peak in scan 2102.
Experimental evidence on the disappearance of all unknown peaks at sufficiently high temperatures was established for the first time by Dr. N. Palibroda and Dr. P. Glueck at the INSTITUTE FOR ISOTOPIC AND MOLECULAR TECHNOLOGIES (IIIMT) of Cluj-Napoka, Romania, also under TTL support, via a GC-MS MAT 311.

When operated at 150 C, the same sample of AquaFuel tested at NTS, PCFL and USF showed no unknown species at all, and only ordinary light gases with ppm of more complex composites of H, O and C. This provided additional support on magnecules as being made-up of ordinary molecules and atoms under a new bond of magnetic origin.

A number of additional experimental confirmation of the above GC-MS/IRD results are under way and they will be reported in future papers.

3.4. Enhanced energy release of magnetically polarized gases. A most scientifically intriguing and industrially significant features of magnetically polarized gases is a dramatic increase in energy released in thermochemical reactions as compared to the same reactions between the same gases in their conventional state.

This remarkable property is established for AquaFuel beyond credible doubt by numerous independent experimental verifications which I briefly outline below (see Web Site [6b] for a comprehensive reports).

As indicated in chemical analysis (3.1), AquaFuel has about 50 % of H2, 40 % of CO, 9 % of CO2, 0.2 % of O2, and 0.8 % of various composites of H, O and C in ppm.

By recalling that H2 has 300 BTU/cf, simple theoretical calculations show that, according to quantum chemistry, AquaFuel should have about 167 BTU/cf, of which 150 BTU/cf are provided by the hydrogen and the remaining BTU's are provided by the remaining components (excluding noncombustible gases such as CO2). The above theoretical value of energy content was confirmed by ATLANTIC ANALYTIC LAB of Whitehouse, New Jersey, COSA INSTRUMENTS of Norwood, New Jersey, and other independent laboratories [6b].

However, direct experimental tests conducted by comparing methane and AquaFuel in running a Coleman Generator powered by a Tecunseh 10 HP two cycles engine (which I have personally eyewitnessed) have established that AquaFuel produced from tap water has a minimum of 380 BTU/cf, contrary to the prediction by quantum chemistry that it should have 167 BTU/cf, thus
resulting in an increase of energy release of 125 % (sic).

Numerous independent tests have not only confirmed the above experimental findings, but actually increased the anomalous release of energy. For instance, tests conducted by TRI-TECH CORPORATION (the multinational giant in cutting gases), the branch located in Tampa, Florida, and supervised by Mr. Joel D. Rentz, VP and Director of local research facilities, have established that AquaFuel cuts steel bars as fast and efficiently as acetylene which has 2,300 BTU/cf [6b].

This test indicates a loss of efficiency in the comparative burning of AquaFuel and methane in the preceding measurements due to a setting of the Tecunseh two-cycle engine which is effective for methane, but not sufficient to release all energy content of AquaFuel.

A study of the literature and patents on new combustible gases [7] reveals that the above anomaly is typical of all gases produced under an electric discharge and, therefore, it is inherent in all magnetically polarized gases.

Systematic studies on the origin of this anomaly are under way. I provide below a conceptual outline in the hope of stimulating a collegial study of the anomaly due to its evident scientific and industrial significance.

**Expected first origin of increased energy release.**

According to quantum chemistry, gas molecules in their conventional spherical shape due to rotations are ready for chemical reactions. For instance, in reaction

\[ \text{H}_2 + \frac{\text{O}_2}{2} \rightarrow \text{H}_2\text{O} + 57 \text{ Kcal / mol}, \]

it is sufficient that the spherically symmetry hydrogen atoms enters in contact with the oxygen atom to activate the exchange and other molecular forces, thus creating the water molecule.

According to hadronic chemistry this is basically not the case. As one can see via a visual inspection of the isochemical model of the hydrogen molecule (Fig. 1.6) and of the water molecule (Fig. 1.7), the creation of the water molecule requires the prior elimination of rotational motions.

It is then evident that the magnetic polarization eliminates molecular rotations, thus preparing the atoms in the form needed for bonding with other atoms, with consequential increase of the efficiency of the chemical reaction and resulting higher energy release.

Preliminary calculations have however indicated that the above origin of the
energy anomaly is insufficient to provide a quantitative explanation of the more than doubling of the energy release.

**Expected second origin of increased energy release.**

Ordinary molecules have no mutual attractions, again, due to their rotations, while *magnetically polarized molecules can instead attract each other, thus implying an additional increase in the efficiency of reactions* such as (3.3).

Despite their plausibility, the above two origins of the energy anomaly are still insufficient to explain how AquaFuel can cut a steel bar as fast and efficient as acetylene.

**Expected third origin of increased energy release.**

A third plausible origin is suggested by the anomaly of the IR signature of conventional polarized molecules, such as those of Figs. 3.4 and 3.8. In fact, such anomaly implies the presence of *new internal bonds in conventional molecules*, with consequential increase of the binding energy and resulting increase of energy release in exothermic reactions.

Note that a 125 % increase of energy release implies the increase of energy released by reaction (3.3) from 57 Kcal/mole to 137 Kcal/mole.

In summary, *the dramatic increase of energy release by magnetically polarized gases, more than double that of the same unpolarized gases, is the most convincing evidence I have encountered to date on the insufficiencies of quantum chemistry in its most important topic, the molecular structure.*

### 3.5. The new technology of magnetically polarized gases at Toups Technology Licensing.

It is evident that all the above properties imply the birth of the *new technology of magnetically polarized gases* which is currently under systematic development and comprehensive patenting at **TOUPS TECHNOLOGY LICENSING** (TTL).

This new technology is based on new means for inducing the polarization of the orbits of (come of) the electrons of conventional gases, and includes comprehensive structural analyses of the gases, as well as measurements of their anomalous physical characteristics and chemical behavior.

As an indication, the measurement of the number of octanes of AquaFuel as a fuel have not been possible because readings went over the upper limit of the instrument scale (150 octanes) and no octane measuring equipment is apparently available for over that limit.

This evidence alone is sufficient to establish Anomaly 3.5 on the mutation of
physical characteristics.

Since a number of developments are currently under patenting, I am not at liberty to identify in detail the various aspects and applications of the new technology. I therefore limit myself to the following indications:

**More efficient methods of liquefaction of conventional gases.** A strong magnetic polarization of any gas is expected to create significant molecular attractions. Less energy for liquefaction is then expected.

**Better fuels.** The magnetic polarization of any fuel (whether gaseous or liquid) is expected to yield: 1) an increase in energy content as studied in Sect. 3.4; 2) an increase in number of octanes without any chemical manipulation; and 3) a consequential improvement of the combustion exhausts. The automotive implications are evident and so are others, such as the use of k, magnetically polarized hydrogen and oxygen gases in rocket propulsion is expected to permit a significant increase of the payload for the same amount of fuel or its decrease for the same payload.

**More efficient fuel cells.** As it is well known, current practical applications of fuel cells are limited by their low efficiency. An enhancement of their efficiency is evidently expected from any enhancement of energy release.

I hope to present in some future papers more technical disclosures of the new technology.

4. EXPERIMENTAL EVIDENCE OF MAGNECULES IN LIQUIDS AND SOLIDS AT GIVAUDAN-ROURE CORPORATION

4.1. Creation of magneecules in liquids. The way in which I first created magneecules in liquids is the following.

In early 1998 I obtained a number of samples of fragrance oils thanks to the courtesy of the multinational giant in the perfumes industry, GIVAUDAN ROURE CORPORATION (GR) with headquarters in Teaneck, New Jersey, and thanks in particular to: Mr. Andrew J. Hershee, Senior Vice President; Dr. Thomas McGee, Senior Vice President for; Mr. Kenneth L. Purzycki, Director of Fragrance Science; Dr. Konrad Lerch, Senior Vice President and Director of Corporate Research Laboratories in Dubendorf, Switzerland; and other GR members. The samples were obtained also via the collaboration of Mr. Lawrence Perovetz,
President of MILLENNIUM CORPORATION (MC) of Orlando, Florida.

I then placed about 50 cc of various samples of perfectly transparent fragrance oils in individual glass containers and immersed in the oils one polarity of an alnico permanent magnet with 12,000 G and dimension 1/2" x 1" x 2" supplied by BUNTING MAGNETIC CORPORATION of Newton, Kansas.

Starting with perfectly clear oils of known viscosity, I observed after a few days a visible darkening of the oils, jointly with a visible increase of the viscosity, changes which evidently varied from oil to oil. Both the darkening and the viscosity increased progressively in subsequent days, to reach in certain cases a dark brown color completely opaqueness to light and an increase in viscosity to such an extent to lose all fluidity.

Following the darkening, in certain samples there was the creation of floating objects which grew in time to such a size to be visible to the naked eye.

I should stress that the above visible effects are of pure magnetic origin because of the lack of any other contribution, e.g., the complete absence of any additives. After the immersion of the permanent magnets, all samples were left open and undisturbed at ordinary room conditions.

The above tests established beyond scientific doubt that the alteration of the characteristics of the oil was of sole magnetic origin, thus excluding all other possible sources.

My main hypothesis on the reason for the darkness of the oils is that their molecules acquire a magnetic polarization of in the orbits of at least some of their electrons (cyclotron resonance orbits), by therefore bonding to each other along lines similar to those for gases.

I should indicate that the samples of fragrance oils were sent from Givaudan-Roure Corporation for novel applications I am not at liberty to disclose at this writing. In this presentation I merely disclose essential scientific aspects.

Moreover, the reader should be aware that immersion of one polarity of a permanent magnet in fragrant oils is, evidently, the most rudimentary possible way to create magnecules and that a number of more sophisticated magnetic polarization techniques are now available with a rather complex geometry which also I am not at liberty of disclosing at this time.

4.2. Photographic evidence of magnecules in liquids. The following Figures 4.1 and 4.2 were taken via an optical microscope by Dr. Konrad Lerch, Senior Vice President and Director of the GR Corporate Research Laboratories in Dubendorf, Switzerland, and his associates, with the assistance of Mr. Lawrence
FIGURE 4.1: First photographic evidence of magnecules in liquids obtained by Dr. Konrad Lerch, Director of the GR Research Laboratory in Dubendorf, Switzerland, on the GR fragrance oil "ING258IN Test 2" under magnifications 10X and 100X.
FIGURE 4.2: Additional photographs of magneules also in "ING258IN Test 2" under magnifications 10X and 100X and also obtained at the GR Research Laboratory in Dubendorf, Switzerland. Note the difference in magneule sizes with the preceding figure.
FIGURE 4.3: Confirmation of magnecules in GR fragrance oil "Mixture 2" under 10X and 100X obtained by analyst David Fries at USF. Note the difference in sizes of the magnecules and their difference with those of Figs. 4.1 and 4.2.
FIGURE 4.4: Additional photographs of magnecules, this time in GR fragrance oil "INX-02349", also obtained by analyst David Fries at the USF. The visible bubbles are of unknown composition.
Perovetz, MC President.

The pictures refer to the GR fragrance oil received under the code "ING258AIN, Text 2" subjected to the rudimentary magnetic polarization indicated in the preceding section under the respective magnification 10X and 100X.

As one can see, these photographs establish that, under the indicated magnetic treatment, the oil has acquired a structure of the type of "brick layering" which is visible under only 10X magnification (top of Figs. 4.1 and 4.2), which is perse highly anomalous for a liquid that was originally fully transparent. The magneclues are constituted by the individual "bricks" shown in the 100X magnification (bottom of the figures).

Inspection of the various photograph shows a variety of sizes of magneclues, thus establishing their lack of unique characteristics for any given oil. This evidently confirms the lack of a valence bond (evidently because the latter would imply a fixed maximal size). The photographs also show the magneclues capability for accretion, that is, the capability of increasing their size via the addition of further oil molecules.

The photographs in Figures 4.3 and 4.4 were taken by analyst David Fries of the CENTER FOR OCEAN TECHNOLOGY of the UNIVERSITY OF SOUTH FLORIDA (USF) in St. Petersburg, thanks to financial support by TOUPS TECHNOLOGY LICENSING (TTL) of Largo, Florida.

These additional photographs are for the same magnifications 10X and 100X, but refer to different GR fragrance oils. Fig. 4.3 depicts the GR oil "Mixture 2" magnetically treated to such a point to completely lose transparency and fluidity while Fig. 4.4 depicting GR oil "INX-01349" with a visible change in color and increase in viscosity.

As one can see, the latter picture provide incontrovertible confirmation that, following exposure to a 12,000 G magnetic field, fragrance oil molecule bond together into rather large clusters estimated to be well in excess of 10,000 a.m.u., thus confirming Anomaly 3.1 for liquids.

Other photographic documentations of various magneclues in liquids are available confirming the above findings. They are not reproduced here for brevity.

4.3. Spectroscopic evidence of magneclues in liquids. The first experimental evidence on magneclusters in liquids was established on May 5, 1998, by analysts Brian Wallace and Mia Burnett at TEKMAR-DOHRMANN CORPORATION (TDC) in Cincinnati, Ohio, by operating a Tekmar 7000 HT Static Headspacer Autosampler equipped with a Flame Ionization Detector (FID). The tests were repeated on May 8 and 11, 1998, by confirming the preceding results. The
tests were done with the assistance of Mr. Lawrence Perovetz, MC President.

The measurements were done on: Sample 1, pure (magnetically untreated) GR 'Fragrance Oil 2'; Sample 2, magnetically untreated tap water; and Sample 3, a magnetically treated mixture of the two.

It should be noted that the Tekmar equipment lacks the computer search as well as the UV scan. Also, recall that magneules in a light gas can have molecular weight all the way to 1,000 a.m.u. and more, as established in AquaFuel.

It then follows that magneules in liquids can have much bigger molecular weight all the way to 10,000 amu and more, thus requiring instruments cryogenically operated and kept at room temperature, equipped with extra large feeding lines, and capable to scan all the way to very high molecular weights. The latter features were absent in the considered Tekmar instrument.

Despite that, the results of the Tekmar tests constitute the first direct spectroscopic experimental evidence of the existence of magneules in liquids, including the first direct experimental evidence of water magneplexes as per Definition 2.1 (see the complete documentation in Appendix IV of Ref. [3f]).
## DEFAULT REPORT

<table>
<thead>
<tr>
<th>Peak</th>
<th>Component Name</th>
<th>Time (s)</th>
<th>Area (uA s)</th>
<th>Area (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>4.620</td>
<td>3766.00</td>
<td>0.01</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>6.522</td>
<td>432.00</td>
<td>0.00</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>5.479</td>
<td>8800.50</td>
<td>0.43</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>5.731</td>
<td>1190.12</td>
<td>0.01</td>
</tr>
<tr>
<td>5</td>
<td>peak 1</td>
<td>6.430</td>
<td>10941.72</td>
<td>74.38</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>7.057</td>
<td>2206.69</td>
<td>0.14</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>7.355</td>
<td>8426.59</td>
<td>0.05</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>7.913</td>
<td>1554.30</td>
<td>0.01</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>9.163</td>
<td>1930.09</td>
<td>0.00</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>8.604</td>
<td>2997.16</td>
<td>3.19</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>10.146</td>
<td>829.09</td>
<td>0.01</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>10.999</td>
<td>338.00</td>
<td>0.00</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>11.469</td>
<td>789.00</td>
<td>0.00</td>
</tr>
<tr>
<td>15</td>
<td></td>
<td>17.602</td>
<td>9646.09</td>
<td>0.05</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>19.245</td>
<td>814.59</td>
<td>0.01</td>
</tr>
<tr>
<td>17</td>
<td></td>
<td>18.971</td>
<td>749.36</td>
<td>0.00</td>
</tr>
<tr>
<td>18</td>
<td></td>
<td>19.002</td>
<td>12350.99</td>
<td>0.09</td>
</tr>
<tr>
<td>19</td>
<td></td>
<td>20.043</td>
<td>182.50</td>
<td>0.00</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td>20.679</td>
<td>4000.46</td>
<td>0.03</td>
</tr>
<tr>
<td>21</td>
<td></td>
<td>21.139</td>
<td>604.15</td>
<td>0.00</td>
</tr>
<tr>
<td>22</td>
<td></td>
<td>21.500</td>
<td>716.33</td>
<td>0.00</td>
</tr>
<tr>
<td>23</td>
<td></td>
<td>22.452</td>
<td>1396.32</td>
<td>0.03</td>
</tr>
<tr>
<td>24</td>
<td></td>
<td>22.837</td>
<td>1188.09</td>
<td>0.01</td>
</tr>
<tr>
<td>25</td>
<td></td>
<td>23.437</td>
<td>10546.00</td>
<td>0.07</td>
</tr>
<tr>
<td>26</td>
<td></td>
<td>23.950</td>
<td>1292.73</td>
<td>0.01</td>
</tr>
<tr>
<td>27</td>
<td></td>
<td>24.241</td>
<td>9518.77</td>
<td>0.04</td>
</tr>
<tr>
<td>28</td>
<td></td>
<td>24.587</td>
<td>980.95</td>
<td>0.01</td>
</tr>
<tr>
<td>29</td>
<td></td>
<td>24.764</td>
<td>700.15</td>
<td>0.00</td>
</tr>
<tr>
<td>30</td>
<td></td>
<td>25.034</td>
<td>221.03</td>
<td>0.00</td>
</tr>
<tr>
<td>31</td>
<td></td>
<td>26.310</td>
<td>189.00</td>
<td>0.00</td>
</tr>
<tr>
<td>32</td>
<td></td>
<td>26.849</td>
<td>7912.00</td>
<td>0.05</td>
</tr>
<tr>
<td>33</td>
<td></td>
<td>27.494</td>
<td>15510.14</td>
<td>0.12</td>
</tr>
<tr>
<td>34</td>
<td></td>
<td>27.461</td>
<td>10444.56</td>
<td>0.07</td>
</tr>
<tr>
<td>35</td>
<td></td>
<td>27.918</td>
<td>1332.00</td>
<td>0.01</td>
</tr>
<tr>
<td>36</td>
<td></td>
<td>29.163</td>
<td>751.49</td>
<td>0.00</td>
</tr>
<tr>
<td>37</td>
<td></td>
<td>29.026</td>
<td>1094.14</td>
<td>0.02</td>
</tr>
<tr>
<td>38</td>
<td></td>
<td>29.169</td>
<td>1312.69</td>
<td>0.01</td>
</tr>
<tr>
<td>39</td>
<td></td>
<td>29.589</td>
<td>3804.00</td>
<td>0.19</td>
</tr>
<tr>
<td>40</td>
<td></td>
<td>29.760</td>
<td>383.00</td>
<td>0.00</td>
</tr>
<tr>
<td>41</td>
<td></td>
<td>30.310</td>
<td>475.00</td>
<td>0.04</td>
</tr>
<tr>
<td>42</td>
<td></td>
<td>31.370</td>
<td>3617.37</td>
<td>0.02</td>
</tr>
<tr>
<td>43</td>
<td></td>
<td>31.710</td>
<td>5165.53</td>
<td>0.02</td>
</tr>
<tr>
<td>44</td>
<td></td>
<td>32.276</td>
<td>306.00</td>
<td>0.00</td>
</tr>
<tr>
<td>45</td>
<td>Peak 3</td>
<td>32.712</td>
<td>11811.33</td>
<td>70.00</td>
</tr>
</tbody>
</table>

| 15973732.00 | 100.00 |

---

**FIGURE 4.5:** A reproduction of one of the scab conducted on May 5, 1998, at 8:18 a.m., by analysts Brian Wallace and Mia Burnett at TEKMAR–DOHRMANN CORPORATION (TDC) in Cincinnati, Ohio, by operating a Tekmar 7000 HT Static Headspace Autosampler equipped with a Flame Ionization Detector (FID). The scan is for a sample of magnetically untreated GR fragrance oil received under the label of “Mixture 2” which results to be composed by three primary molecular constituents with: Peak 1 at 6.430 min and 24.28 %; Peak 2 at 8.604 min and 3.19 %; and Peak 3 at 37.742 and 70.63 % (off scan scale), totaling 97.57 %. This provides the chemical structure of the fragrance oil in Fig. 4.3.
FIGURE 4.6: The first spectroscopic experimental evidence of magneplexes in magnetically treated tap water, achieved on May 5, 1998, at 8:20 a.m. by analyst Mia Burnett and her associates at TDC. The magneplexes are characterized by the large "unknown" peak at 25.763 min for 64.24% identifying an anomalous water clustering.
DEFAULT REPORT

<table>
<thead>
<tr>
<th>Peak</th>
<th>Component Name</th>
<th>Time [min]</th>
<th>Area [um^2]</th>
<th>Area [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>4.612</td>
<td>2909.00</td>
<td>0.02</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>5.021</td>
<td>462.50</td>
<td>0.00</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>5.486</td>
<td>1446.00</td>
<td>0.11</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>5.716</td>
<td>302.00</td>
<td>0.00</td>
</tr>
<tr>
<td>5</td>
<td>peak 1</td>
<td>6.449</td>
<td>70997.00</td>
<td>5.33</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>7.065</td>
<td>17721.09</td>
<td>0.13</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>7.373</td>
<td>24620.75</td>
<td>18.74</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>8.174</td>
<td>2041.55</td>
<td>0.01</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>9.273</td>
<td>339.50</td>
<td>0.00</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>10.438</td>
<td>653.50</td>
<td>0.01</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>10.987</td>
<td>407.59</td>
<td>0.00</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>10.454</td>
<td>37775.91</td>
<td>0.25</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>10.332</td>
<td>405.00</td>
<td>0.00</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>12.302</td>
<td>45046.00</td>
<td>0.34</td>
</tr>
<tr>
<td>15</td>
<td></td>
<td>12.325</td>
<td>735.59</td>
<td>0.01</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>16.080</td>
<td>363.50</td>
<td>0.00</td>
</tr>
<tr>
<td>17</td>
<td></td>
<td>16.215</td>
<td>299.50</td>
<td>0.00</td>
</tr>
<tr>
<td>18</td>
<td></td>
<td>17.163</td>
<td>405.19</td>
<td>0.00</td>
</tr>
<tr>
<td>19</td>
<td></td>
<td>17.607</td>
<td>8138.73</td>
<td>0.06</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td>17.999</td>
<td>278.44</td>
<td>0.00</td>
</tr>
<tr>
<td>21</td>
<td></td>
<td>18.323</td>
<td>773.50</td>
<td>0.01</td>
</tr>
<tr>
<td>22</td>
<td></td>
<td>19.101</td>
<td>7931.00</td>
<td>0.06</td>
</tr>
<tr>
<td>23</td>
<td></td>
<td>20.350</td>
<td>1513.00</td>
<td>0.01</td>
</tr>
<tr>
<td>24</td>
<td></td>
<td>20.644</td>
<td>3323.49</td>
<td>0.03</td>
</tr>
<tr>
<td>25</td>
<td></td>
<td>21.403</td>
<td>6040.06</td>
<td>0.03</td>
</tr>
<tr>
<td>26</td>
<td></td>
<td>22.477</td>
<td>2437.00</td>
<td>0.03</td>
</tr>
<tr>
<td>27</td>
<td></td>
<td>23.048</td>
<td>3399.00</td>
<td>0.00</td>
</tr>
<tr>
<td>28</td>
<td></td>
<td>23.453</td>
<td>8746.50</td>
<td>0.07</td>
</tr>
<tr>
<td>29</td>
<td></td>
<td>23.945</td>
<td>5373.77</td>
<td>0.04</td>
</tr>
<tr>
<td>30</td>
<td></td>
<td>24.296</td>
<td>9748.23</td>
<td>0.06</td>
</tr>
<tr>
<td>31</td>
<td></td>
<td>24.777</td>
<td>1228.49</td>
<td>0.01</td>
</tr>
<tr>
<td>32</td>
<td></td>
<td>25.944</td>
<td>2011.60</td>
<td>0.02</td>
</tr>
<tr>
<td>33</td>
<td>unknown 1</td>
<td>25.272</td>
<td>22956.61</td>
<td>1.75</td>
</tr>
<tr>
<td>34</td>
<td></td>
<td>26.247</td>
<td>152911.39</td>
<td>11.16</td>
</tr>
</tbody>
</table>
FIGURE 4.7: The first spectroscopic experimental evidence of magnecules in liquids achieved on May 5, 1998, at 8:21 a.m., by analysts Brian Wallace and Mia Burnett at TDC, on a magnetically treated combination of GR "Mixture 2" and tap water. Note the primary constituents: a first peak at 6.449 for 5.33 %; a second peak at 7.373 min for 18.74 %; a third peak listed by the equipment as "unknown 1" at 26.272 min for 1.75 %; a fourth peak at 26.947 for 1.16%; a fifth peak listed by the equipment as "unknown 2" at 31.491 for 0.45 %; and a sixth peak at 32.758 min for 68.71 %; totaling 96.14 %. Comparison of these data with those on the untreated oil as well as untreated water establish numerous macroscopic alterations (mutations) of chemical constituents, their ramp time and their percentages which can only be interpreted as due to magnecules.
FIGURE 4.8: The first spectroscopic experimental evidence of anomalous adhesion of magnetically treated liquids achieved on May 5, 1998 at 2:06 p.m., by analysts Brian Wallace and Mia Burnett and her associates a TDC, depicting a background following the tests similar to the tests themselves, including new "unknowns". It should be noted that, at the time of the tests, the analysts were unaware of the anomaly.
FIGURE 4.9: The subsequent print-out of the TDC tests at 2:08 p.m. on the magnetically treated water. Note the visible difference with the test of Fig. 4.6 due to the anomalous adhesion of oil molecules which remained in the instrument.
FIGURE 4.10: The subsequent print-out of the TDC tests at 2:08 p.m. on the background which confirms the anomalous adhesion of magnecules.
FIGURE 4.11: The first spectroscopic experimental evidence of the mutation of magnecules in liquids achieved on May 8, 1998, at 12:21 p.m., by analysts Brian Wallace and Mia Burnett and her associates at TDC. The scan deals with the magnetically treated combination of GR fragrance oil "mixture Z" and tap water with a first peak at 6.404 min for 5.94 %; a second peak at 7.325 min for 19.12 %; a third peak at 26.751 min for 18.23 %; a fourth peak at 32.650 min for 42.77 %; and a fifth peak at 35.160 min for 11.60 %; totaling 97.66 %. The mutation is established by the comparison of this scan with the preceding ones.
**DEFAULT REPORT**

<table>
<thead>
<tr>
<th>Peak</th>
<th>Component Name</th>
<th>Time [min]</th>
<th>Area [uA*s]</th>
<th>Area [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>0.503</td>
<td>2644.00</td>
<td>0.03</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>5.431</td>
<td>16233.30</td>
<td>0.12</td>
</tr>
<tr>
<td>3</td>
<td>peak 1</td>
<td>6.468</td>
<td>79272.00</td>
<td>0.74</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>7.039</td>
<td>16932.00</td>
<td>0.13</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>7.375</td>
<td>255007.00</td>
<td>19.12</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>9.324</td>
<td>636.00</td>
<td>0.08</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>9.220</td>
<td>415.00</td>
<td>0.09</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>9.965</td>
<td>427.00</td>
<td>0.09</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>10.220</td>
<td>309.00</td>
<td>0.09</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>10.390</td>
<td>30889.30</td>
<td>0.23</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>10.877</td>
<td>298.00</td>
<td>0.09</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>11.123</td>
<td>39980.03</td>
<td>0.30</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>12.307</td>
<td>416.00</td>
<td>0.00</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>14.306</td>
<td>966.50</td>
<td>0.01</td>
</tr>
<tr>
<td>15</td>
<td></td>
<td>14.132</td>
<td>365.00</td>
<td>0.00</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>17.103</td>
<td>2210.00</td>
<td>0.03</td>
</tr>
<tr>
<td>17</td>
<td></td>
<td>17.300</td>
<td>924.00</td>
<td>0.01</td>
</tr>
<tr>
<td>18</td>
<td></td>
<td>19.031</td>
<td>267.50</td>
<td>0.00</td>
</tr>
<tr>
<td>19</td>
<td></td>
<td>19.010</td>
<td>4661.50</td>
<td>0.01</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td>19.031</td>
<td>426.00</td>
<td>0.00</td>
</tr>
<tr>
<td>21</td>
<td></td>
<td>21.133</td>
<td>2269.00</td>
<td>0.02</td>
</tr>
<tr>
<td>22</td>
<td></td>
<td>22.715</td>
<td>613.00</td>
<td>0.00</td>
</tr>
<tr>
<td>23</td>
<td></td>
<td>23.709</td>
<td>214.00</td>
<td>0.00</td>
</tr>
<tr>
<td>24</td>
<td></td>
<td>24.220</td>
<td>15600.50</td>
<td>0.61</td>
</tr>
<tr>
<td>25</td>
<td></td>
<td>24.704</td>
<td>180.00</td>
<td>0.00</td>
</tr>
<tr>
<td>26</td>
<td></td>
<td>26.701</td>
<td>2434179.45</td>
<td>18.23</td>
</tr>
<tr>
<td>27</td>
<td></td>
<td>27.197</td>
<td>6519.35</td>
<td>0.06</td>
</tr>
<tr>
<td>28</td>
<td></td>
<td>27.196</td>
<td>589.00</td>
<td>0.00</td>
</tr>
<tr>
<td>29</td>
<td></td>
<td>27.019</td>
<td>405.00</td>
<td>0.00</td>
</tr>
<tr>
<td>30</td>
<td></td>
<td>28.390</td>
<td>2294.00</td>
<td>0.02</td>
</tr>
<tr>
<td>31</td>
<td></td>
<td>29.024</td>
<td>752.00</td>
<td>0.01</td>
</tr>
<tr>
<td>32</td>
<td></td>
<td>30.417</td>
<td>167.50</td>
<td>0.00</td>
</tr>
<tr>
<td>33</td>
<td></td>
<td>31.395</td>
<td>4233.50</td>
<td>0.16</td>
</tr>
<tr>
<td>34</td>
<td></td>
<td>31.649</td>
<td>1279.00</td>
<td>0.01</td>
</tr>
</tbody>
</table>
FIGURE 4.12: A print-out of the TDC tests on May 11, 1998, at 8:07 a.m. on the magnetically treated combination of GR “Mixture 2” and tap water. Comparison with the preceding scans provides additional confirmation of the mutation of magnecules.
## DEFAULT REPORT

<table>
<thead>
<tr>
<th>Peak</th>
<th>Component Name</th>
<th>Time [min]</th>
<th>Area [µm²]</th>
<th>Area [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>4.507</td>
<td>212.20</td>
<td>0.70</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>5.445</td>
<td>607.09</td>
<td>0.22</td>
</tr>
<tr>
<td>3</td>
<td>peak 1</td>
<td>6.394</td>
<td>560.50</td>
<td>0.20</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>7.321</td>
<td>205.00</td>
<td>0.07</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>16.567</td>
<td>212.00</td>
<td>0.01</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>19.025</td>
<td>4595.00</td>
<td>0.14</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>23.575</td>
<td>1010.00</td>
<td>0.03</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>24.137</td>
<td>1071.22</td>
<td>0.05</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>24.625</td>
<td>2993.79</td>
<td>0.12</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>25.772</td>
<td>149764.60</td>
<td>1.39</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>29.429</td>
<td>2470.00</td>
<td>0.11</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>30.597</td>
<td>63235.66</td>
<td>1.96</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>31.973</td>
<td>43614.67</td>
<td>1.54</td>
</tr>
<tr>
<td>14</td>
<td>peak 2</td>
<td>32.600</td>
<td>21437.42</td>
<td>0.66</td>
</tr>
<tr>
<td>15</td>
<td></td>
<td>33.156</td>
<td>6631.09</td>
<td>0.14</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>33.314</td>
<td>1647.06</td>
<td>0.07</td>
</tr>
<tr>
<td>17</td>
<td></td>
<td>33.947</td>
<td>12421.19</td>
<td>0.30</td>
</tr>
<tr>
<td>18</td>
<td></td>
<td>35.132</td>
<td>50118.03</td>
<td>15.52</td>
</tr>
<tr>
<td>19</td>
<td></td>
<td>35.612</td>
<td>14336.19</td>
<td>0.45</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td>36.325</td>
<td>2586.10</td>
<td>0.11</td>
</tr>
<tr>
<td>21</td>
<td></td>
<td>37.004</td>
<td>152485.00</td>
<td>4.79</td>
</tr>
</tbody>
</table>

FIGURE 4.13: A print-out of the TDC tests on May 11, 1998, at 8.08 a.m. on the background which confirms the anomalous adhesion of magnetically polarized liquids.
Comprehensive tests via a very modern equipment for Liquid Chromatographic Mass Spectroscopy (LC-MS) with UltraViolet Detector (UV) were conducted on the same GR fragrance oil "ING258IN Test 2" of Figures 4.1 and 4.2, on December 1, 1998, by Prof. Kenneth G. Furton, Chairman, and Prof. Piero R. Gardinalli, Laboratory Director, DEPARTMENT OF CHEMISTRY of FLORIDA INTERNATIONAL UNIVERSITY (FIU), Miami, Florida. The tests were then repeated on December 17 and 18 by confirming the preceding results.

The tests were conducted under a number of technical characterizations specifically selected to detect magnecules, among which I recall:

1) Total Ion Chromatogram (TIC) collected under the positive ion atmospheric pressure electrospray ionization (ESI+) mode;
2) Integrated TIC with retention times and areas for the most abundant peaks;
3) Raw mass spectra for all peaks identified in item 2;
4) HPLC chromatograms collected at fixed wavelength of 254 cm;
5) UV-visible spectra form the HPLC diode array detector from 230- to 700 nm.

The tests were conducted on the following samples:
A) Sample GR331, the magnetically untreated, fully transparent GR fragrance oil "ING258IN Test 2";
B) Sample GR332, magnetically treated "ING258IN Test 2" with 10 % DiproPylene Glycol (DPG);
C) Sample GR332S, bottom layer of the preceding sample;
D) Sample GR335, magnetically treated mixture 4 % GR fragrance oil "ING258IN Test 2", 0.4 % DPG and 95 % tap water;
E) Sample GR335O, visible dark clusters in the preceding sample.

To avoid a prohibitive length of this presentation, in the following I only reproduce ten main print-out of the comprehensive and detailed documentation obtained at FIU (which is available in its entirety as Appendix V of Ref. [37]).

Inspection of the print-outs (as well as the comprehensive documentation) shows that the tests conducted at FIU on GR fragrance oil "ING258IN Test 2" provide conclusive experimental evidence on the existence of magnecules in liquids.
FIGURE 4.14: FIU scan on the untreated GR oil "ING2581N Test 2" of Figs. 4.1, 4.2.
FIGURE 4.15: Confirmation of the preceding chemical structure.
Figure 4.6: FTU scan on the chemical structure of the magnetically treated QR oil. Note the initiation of the appearance of new peaks.
FIGURE 4.17. FU scan on the chemical structure of the magnetically treated CR oil.

Field of sample identification: CR332
0108

Advanced Mass Spectrometry Facility

Navigator II LC/MS
1: Scan ES+
TIC
2:2*7
Area
Cone Voltage 30

- Background Signal -
FIGURE 4.18: FIU scan on the chemical structure of the bottom layer of the sample of the preceding print-out. Note the large increase of the new peak in the r.h.s.
and 95% tap water. Note the persistence of the large new peak in the R.T.s.

FIGURE 2B. FTU scan on the magnetically treated 4% CR oil "NO25SIN Test 2". 0.4% DG.
FIGURE 4.21: Confirmation of the preceding results.
FIGURE 4.22: FIU scan on the large dark structures in the samples of the preceding printout. Note the persistence again of the large new peak in the r.h.s.
4.4. Magnetic mutations of physical characteristics in liquids. The existence of magnecules in liquids implies necessary alterations, called mutations, of physical characteristics, such as increase of the specific density and viscosity. This is due to the fact that magnetic bonds among ordinary molecules imply an evident reduction of intermolecular distances, thus resulting in more molecules per unit volume as compared to the magnetically untreated liquid. The increase in viscosity is then consequential.

The reader should be aware up-front that I am not referring to esoteric changes in minute amounts, but rather to large macroscopic alterations often visible to the naked eye, which are at times such to alter completely the original state, as it was the case the complete loss of transparency and fluidity in the magnetically treated oils of Figures 4.3.

At a deeper level, it appears that the mutation of physical characteristics are due to various contributions, such as:

1) the elimination under a suitable magnetic field of (at least some of the) rotational motions of the molecules which, per se, implies a decrease of their average volume with consequential increase of the specific density;

2) the polarization of the orbits of the valence electrons which imply an additional decrease of the average molecular volume and consequential increase of the specific density, viscosity and other characteristics; and

3) the magnetic bond among different molecules which implies additional contributions to the indicated mutations.

In this section I report direct experimental evidence on measurements of specific density, viscosity and other characteristics which confirms the above prediction.

In all samples I used ordinary tap water and a number of GR fragrant oils. All samples here considered were prepared by conventionally mixing tap water and one fragrant oil and then submitting that mixture to rather weak permanent magnets of 200 G (much weaker than those used for Pictures 4.1 and 4.2) via an equipment protected by patent applications I am not at liberty to disclose at this time. All samples resulted to be very stable without any measurable change over a period of about year.

In early 1998 I prepared various samples along the above procedure numbered from 1 to 25. The measurements of the specific density were conducted on March 9, 1998 by analyst Dr. A. Sibille at the SGS U.S. TESTING COMPANY, INC. (USTC) of Fairfield, New Jersey under assistance by Mr. Lawrence Perovetz, President of Millennium Corporation (MC) of largo, Florida. The
results of the tests are presented in the following figure.

Sample 1 is ordinary untreated tap water. Sample 2 is ordinary tap water magnetically treated for about 5 minutes. Samples 3 and 4 were tap water treated with other magnetic equipment. Sample 5 was ordinary untreated GR fragrance oil received under the code of "APC Fragrance". Sample 6 was a mixture of fragrance oil 5 with tap water magnetically treated for about 5 minutes. Mixtures 7 and 8 were the same mixture 5 although treated with other equipment. Magnetically treated fragrance 17 was a GR oil received under the code "Air Freshener 1". Mixture 19 was Fragrance 17 with tap water 16 magnetically treated for 5 minutes. Note that all measurements of the following figure were done to an accuracy of the fourth digit. Therefore, numerical results up to the third digit can be considered accurate.

In the transition from Sample 1 [untreated water] to Sample 2 [magnetically treated water] there is an increase of the specific density in the macroscopic amount of 0.86% thus confirming the indicated magnetic mutation of water.

In turn, the increase in density clearly supports the existence of magneplexes in magnetically treated water, as detected earlier.

As well known, fragrance oils are (generally) lither than water, i.e., the specific density of the untreated fragrance in Sample 5 is smaller than that of the untreated water in Sample 1. According to quantum chemistry, the specific density of any mixture of the above two liquids, whether solution, suspension or dispersion, must be in between the lither and heavier specific densities.

On the contrary, as one can see in the following figure, the specific density of the magnetically treated mixture of GR "APC fragrance 1" with tap water, Sample 6, resulted to be bigger than that of the densesi liquid, the water. This measurement constitutes additional, rather strong, direct experimental verification of the magnetic mutation of physical characteristics in liquids.

The reader should be made aware that the above anomaly (a mixture of two liquids whose specific density is bigger than that of the heaviest of the two) cannot be explained via conventional quantum chemical knowledge. The presentation of scientifically credible opposing views is here solicited.

On the contrary, the anomaly is theoretically predicted and quantitatively treatable by the covering hadronic chemistry [3] via the creation of magnecules.

A remarkable point is that the magnetic mutations of density are macroscopically large. In fact, they were called by an analyst "UPS-type anomalies", meaning that the shipment via UPS of a given volume of a magnetically treated liquid requires an increase of the shipping cost due to the
macroscopic increase of the weight.

A further prediction of magnetically polarized liquids is the increase of its viscosity. This is evidently due to the arbitrary size of an individual magneucle, as well as the tendency of the same to bond near-by molecules, resulting in accretions, not mention the anomalous adhesion to the walls of the container which has been systematically detected for all magnetically polarized liquids.

As indicated earlier, in certain cases the increase of viscosity is so large to be first visible to the naked eye and, when the treatment is sufficiently protracted, the increase of viscosity is such to lose the customary liquid mobility.

Ordinary engine oils are particularly suited for magnetic treatment because their increase in viscosity is so dramatic to be rapidly visible to the naked eye jointly with a visible, also dramatic change in visual appearance (color, texture, opacity, etc.).

The measurements on viscosity are reported in a subsequent figure. They were done on March 9, 1998 by analyst J. R. Tyminski at SGS U.S. TESTING COMPANY, INC. of Fairfield, New Jersey, under assistance by MILLENNIUM CORPORATION. The selected engine oil was an ordinarily available 30-40 Castrol Motor Oil subjected to magnetic treatments via two different equipment called of Type A and B. All treatments were done at ordinary conditions in the outsider of the oil container without any additive or change of conditions of any type.

An one can see, measurement 2 shows a dramatic increase of the viscosity in the magnetically treated oil of 44.5% as compared to the viscosity of the untreated oil, while measurement 3 shows an increase in viscosity of 51.2%.

The above experimental results evidently provide additional support for the the existence of magneules.

The tests on viscosity also provide evidence of the anomalous adhesion of liquids with magneules which is establishes in this case by a dramatic, macroscopic increase of adhesion of the oil to the walls of the glass container visible by the naked eye.

The same macroscopic anomaly is confirmed at the microscopic level. During the measurement of viscosity there was such an anomalous adhesion of the magnetically treated oils to the walls of the instrument that could not be removed via routine cleaning with acetone and required the use of strong acids.

This anomalous adhesion is further experimental evidence on the existence of magneules because of their predicted capability to induce the polarization of the orbits of the valence electrons of the atoms in the walls of the container, thus resulting in anomalous adhesion via magnetic bonds due to induction.
Samples were transferred to a separatory funnel. The layers were allowed to separate. The water layer was withdrawn into a funnel with Whatman #4 filter paper. The filtrate was transferred to a preweighed 10 mL volumetric flask. The sample was weighed to 0.0001 grams and the density calculated.

When the samples were pure substances, they were transferred directly to preweighed 10 mL volumetric flasks.

Calculations:

\[ \text{Weight of sample} - \text{weight of flask + volume of flask} = \text{g/mL} \]

Arlene Sible, Ph.D.

FIGURE 4.24: USTC measurements of specific density on magnetically treated liquids.
## REPORT OF TEST

**SGS U.S. Testing Company Inc.**

291 Fairfield Avenue
Fairfield, NJ 07004-3833
Tel: 973-575-6252
Fax: 973-244-1694

**Report Number:** 103947  
**Date:** 03/09/98  
**Page:** 1 of 1

### SUBJECT:

Three (3) samples received on 02/09/98.

### PURPOSE:

Determine the density and viscosity of the three samples.

### TEST DATE:

02/25/98

### PROCEDURE:

Three 10 milliliter volumetric flasks were pre-weighed. One of the samples was transferred to each of the volumetric flasks with a pipet. The samples were weighed again. The density of each sample was calculated.

The three oil samples were measured for viscosity using a Kinematic viscometer (ASTM D-445).

### RESULTS:

<table>
<thead>
<tr>
<th>Sample Identification</th>
<th>Density (g/mL)</th>
<th>Viscosity (cS)</th>
<th>Increase Viscosity, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Motor Oil, &quot;as is&quot;</td>
<td>0.8682</td>
<td>199.8</td>
<td>0</td>
</tr>
<tr>
<td>2) Motor Oil, Treatment Type A</td>
<td>0.8714</td>
<td>234.7</td>
<td>44.5</td>
</tr>
<tr>
<td>3) Motor Oil, Treatment Type B</td>
<td>0.8689</td>
<td>302.0</td>
<td>51.2</td>
</tr>
</tbody>
</table>

\[\text{SIGNED FOR THE COMPANY BY:}\]

James R. Tyminski  
Laboratory Supervisor

Arlyn Sible, Ph.D.  
Laboratory Director

---

**FIGURE 4.25:** USTC measurements of viscosity on magnetically treated liquids.
It is evident that the magnetic mutations of density and viscosity implies the expected mutation of all other physical characteristics of the liquid considered. Measurements along these lines are solicited (see next section).

The existence of mutation of physical characteristics then implies the mutation of chemical features. At this moment I can indicate the visual evidence reported by the analysts of USTC according to whom the reaction of magnetically treated oils with acetone is dramatically different than that with untreated oil, beginning with a visual mutation in color, texture and other appearances. I am not at liberty at this moment to report additional evidence of chemical anomalies.

More importantly, the reader should be aware that chemical reactions of magnetically polarized liquids are predicted to experience a mutation of their thermodynamical behavior, resulting in certain case in an increase of calories per mole.

Systematic studies on chemical mutations are under way and they will be reported at some future time.

4.5. Examples of industrial applications of magnetically polarized liquids. It is evident that all the anomalies in liquids identified in this section have novel industrial applications in a variety of fields, including, but not limited to, the fragrance industry, automotive industry, paint industry, adhesive industry, medicine, etc. These applications are under patent pending and other industrial protections.

Evidently I am not at liberty to disclose these applications in the necessary details at this time. I can nevertheless present below illustrative lines (all under patent pending) that any scientist can easy derive form the indicated anomalies.

Applications to automotive industry, such as: the use in a gear box of a lubricant subjected to an appropriate magnetic treatment implies the presence of sufficient lubrication at start-ups after lack of use. When conventional lubricants are used, non-immersed gears are virtually dry after a few hours of lack of use; the enhancement of energy content and octanes; and others.

Application to paint industry, such as: the use of the increased penetration of magnetically treated liquids within porous surface to produce more efficient and longer lasting paints; or the use of magnetically treated marine paints for hulls of metal ships, which is expected to last longer than conventional paints, evidently. In fact, the magnetically treated paints induce a polarization of the atoms in the metal walls, thus resulting in an anomalous adhesion which is
typical of liquids with magnecules.

**Applications to medicine**, such as lotions subjected to the magnetic treatment herein considered, which are expected to penetrate the human skin much deeper than the same untreated lotions; or the study of conceivable new forms of local delivery of medications thru the skin (e.g., the deep local penetration of antibiotics in wounds), by therefore avoiding its current delivery to the entire body.

The above (and other) novel applications warrant additional scientific and industrial research and development on magnecules in liquids.

### 4.6. Evidence of magnecules in solids.

In the preceding sections I have presented theoretical and experimental evidence of the existence of magnecules in gases and liquids.

The direct experimental evidence on the existence of magnecules in solids available at this writing is so simple to appear naive.

It is given by the evidence that **all liquids with magnecules systematically preserve the new species when frozen, as established by the recovering of anomalous features when returning to the liquid state, as well as the preservation at the solid state of opacity and other features**.

Also, magnecules can be directly verified under microscopic observation to persist at the solid state.

Needless to say, the above simplest possible evidence in solids is only the beginning of various possibilities. I merely mention here in depth study on the true chemical composition of **solids created under intense magnetic fields**, such as fullerenes [5] and other composites.

The latter study is under way and I shall report the results in some future paper.

### 5. CONCLUDING REMARKS

In this memoir I have presented the theoretical prediction and several independent experimental verifications of the existence of a new chemical species I submitted under the name of magnecules, which is composed by clusters of atoms and molecules under a new strong bond of non-valence type and which is
stable at ordinary conditions.

The reason why this new species was not discovered time ago is the silence throughout this century in the vast literature of both quantum mechanics and chemistry of the magnetic moment created by the orbiting of valence and other electrons.

These magnetic moments are been ignored because of the general distribution in space of the motion of electrons, with consequential impossibility of their detection.

However, one of the most rigorous disciplines of this century, quantum electrodynamics, has established that electron orbits must acquire a polarization in a plane under sufficiently intense external magnetic fields, as well known in atomic physics.

Simple calculations for the hydrogen atom then show that the magnetic moment of its polarized electron orbit is 1,316 times bigger than the magnetic moment of the nucleus (the proton).

Such a large value of the orbital magnetic moment then sets the foundations of the new species of magnecules, as well as of the new technology for their production.

Quite remarkable are the variety and amount of alterations, called mutations, of physical and chemical characteristics under said magnetic polarization, which provide the foundations for numerous novel industrial applications.

Intriguingly, the results presented in this memoir constitute the most compelling experimental evidence known to me at this time on the insufficiency of quantum mechanics for the treatment of the hydrogen and other molecules, while being exact for the structure of the hydrogen atom, as illustrated in Fig. 1.4. The insufficiency of quantum chemistry is then consequential.

In fact, the assumption of quantum mechanics as being exact for molecular structures requires a point-like approximation of overlappings wavepackets of valence electrons, with numerous irreconcilable consequences in disagreement with experimental evidence, such as correlations among an arbitrary number of electrons, prediction of molecules with an arbitrary number of atoms, the ferromagnetic character of all molecules, and other inconsistencies.

The use instead of the covering quantum mechanics and chemistry allows the resolution of the above inconsistencies, by permitting the theoretical prediction and quantitative treatment of the new species of magnecules in a way compatible with experimental data to several digits.

Among the various macroscopic mutations induced by magnetic
encouragement and assistance.

Additionally, I have no words to express my appreciation and gratitude to numerous independent analysts who, by conducting various measurements on expected anomalies, proved to be real scientists. Among them I acknowledge measurements conducted by the following analysts under support from TROPS TECHNOLOGY LICENSING:

> Analysts **Louis A. Dee**, Branch Manager, and **Norman Wade** of the branch of NATIONAL TECHNICAL SYSTEMS located at MCCLELEN AIR FORCE BASE in North Highland, California;

> Analyst **Kevin Lothropide** of the NATIONAL FORENSIC SCIENCE TECHNOLOGY CENTER, in St. Petersburg, Florida;

> Analyst **David Fries** of the OCEAN TECHNOLOGY CENTER of FLORIDA INTERNATIONAL UNIVERSITY in St. Petersburg, Florida;

> Dr. N. **Palibroda** and Dr. P. **Glueck** of the INSTITUTE FOR ISOTOPIC AND MOLECULAR TECHNOLOGIES of Cluj-Napoca, Romania;

> Analysts **Brian Wallace** and **Mia Burnett** at the TEKMAR–DOHRMAN CORPORATION of Cincinnati, Ohio;

> Professors **Kenneth G. Furton** and **Piero R. Gardinali** of the Chemistry Department of the FLORIDA INTERNATIONAL UNIVERSITY of Miami;

> Professor **M. Fetterolf** of the DEPARTMENT OF CHEMISTRY of the UNIVERSITY OF SOUTH CAROLINA in Aiken;

> Dr. Arlyn **Sibille** and analyst **James R., Timinski** of the SGS U. S. TESTING COMPANY of Fairfield, New Jersey;

> Mr. **Joel D. Rentz** of TRI–TECH CORPORATION in Tampa, Florida;

> Analyst **Shannon Smith** then of the EPA facility in Tampa, Florida;

and others.

It is a duty for me to acknowledge also the invaluable assistance by the staff of various corporations, such as:

It is also a pleasure to thank the staff of numerous corporations, such as:

> **BRIGGS & STRATTON TEST CENTER** of MILWAUKEE, WISCONSIN;

> **EPA** facility in Ann Arbor, Michigan;

> **MOTOR FUELER CORPORATION** of Largo, Florida;

> **COSA INSTRUMENTS**, of Norwood, New Jersey;

> **UNION CORPORATION** in Germany;

> **BADGER INSTRUMENTS**, Tulsa, Oklahoma;

> The **U. S. MILLER, LINCOLN AND THERMODYNAMICS CORPORATIONS**;

> **NASA** at Kennedy Space Center, Florida;

> **ATLANTIC ANALYTIC LABORATORY**, Whitehouse, New Jersey;
> ENVIRONMENTAL CONSERVATION LABORATORIES of Orlando, Florida;
> BIOMEDICS LABORATORIES of Orlando, Florida;
> SOUTHWEST MACHINE CORPORATION of Nika, Missouri.
> CAPOVANI BROTHERS CORPORATION of Scotia, New York;
> DIXIE ARC CORPORATION of Birmingham, Alabama;
> BUNTING MAGNETICS CORPORATION of Newton, Kansas;
> ELECTRON ENERGY CORPORATION of Landsville, Pennsylvania;
> ADAMS MAGNETIC PRODUCTS of Elizabethtown, Kentucky;
> SHIN-ETSU RARE EARTH MAGNETS of Tokyo, Japan;
> CHEMYR POLYTECH LABORATORIES of Maryland Heights, Montana;
> WELDING AUTOMATIC CORPORATION of Anaheim, California;
> Various corporations producing high voltage pulse power units;
> Several other analytic laboratories, testing facilities and corporations.

I also want to express my appreciation and gratitude to numerous colleagues for invaluable consultations on various individual aspects of this research, including: Prof. Dieter Schuch of the INSTITUTE OF PHYSICS of THE UNIVERSITY OF FRANKFURT, Germany; Prof. Peter Gluck of the INSTITUTE FOR ISOTOPIC AND MOLECULAR TECHNOLOGIES of Cluj-Napoca, Romania; Dr. Eugene Mallove Founder and Editor in Chief of INFINITE ENERGY; Professor Tepper L. Gill at the INSTITUTE FOR ADVANCED STUDIES, Princeton, New Jersey; Professors William F. Pound and J. V. Kadeisvili of the INSTITUTE FOR BASIC RESEARCH, Palm Harbor, Florida; and numerous other colleagues.

Needless to say, I am solely responsible for the content of this memoir.

References


3. R. M. Santilli and D. D. Shillady, Ab Initio hadronic chemistry, I: Basic


6. Web site of Toups Technology Licensing
   http://www.toupstech.com [6a];
   http://www.toupstech.com/aquafuel/6b;