**THE STRUCTURE OF WATER**

**and**

**HOW PSYCHE ENTERS MATTER**

***by***

***Dr. Richard Alan Miller, c2015***

[***www.richardalanmiller.com***](http://www.richardalanmiller.com/)

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**Part One**

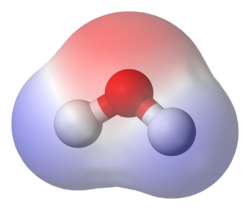
**On The Nature of Water**

To begin any discussion on the nature of water is to first recognize how it appears in nature. Water (H2O) is the most abundant compound on Earth's surface, covering more than 70 percent of Earth’s surface. In nature, it exists in both liquid, solid, and gaseous states.

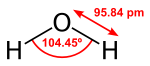
The liquid and gaseous states are in dynamic equilibrium at standard temperature and pressure. At room temperature, water is a tasteless and odorless liquid, nearly colorless with a hint of blue (associated with the oxygen atom).

Many substances dissolve in water, and it is commonly referred to as the universal solvent. Because of this, water in nature (and in use) is rarely pure, and some properties may vary from those of the pure substance. Water is the only common substance found naturally in all three common states of matter.

It is essential for all life on Earth, and makes up 78% of the human body.



One of the more interesting aspects of the chemistry of water is that it is the smallest, yet most common, molecule to have a dipole moment. In physics, an electric dipole moment is a measure of the separation of positive and negative electrical charges in a system of electric charges. A dipole moment is a measure of the charge system's overall polarity.

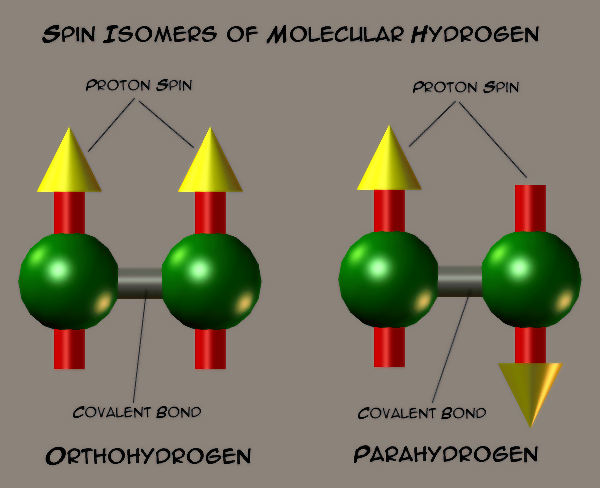


In water, the two hydrogen molecules, combining with a single oxygen molecule, create this dipole. As such, it can be seen as the smallest door in physical space, going from one point in space-time to another. After all, a dipole moment is what determines the direction of electric flow, while creating a magnetic field around the molecule itself.

In modern physics, going from one set of space-time coordinates to another is often referred to as a “dimensional gate.” Water is the smallest known molecule with a dipole moment.

**Ortho- and Para- Water**

Molecular hydrogen (H2) occurs in two isomeric forms, one with its two proton spins aligned parallel (ortho-hydrogen), and the other with its two proton spins aligned antiparallel (para-hydrogen). Each hydrogen molecule consists of two hydrogen atoms linked by a covalent bond. Two different isomers can form, depending on the alignment of the spins.

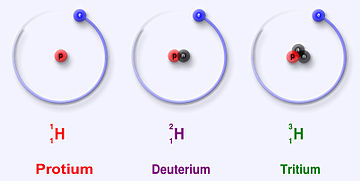


If we neglect the small proportion of deuterium and tritium which may be present, each hydrogen atom consists of one proton and one electron. Each proton has an associated magnetic moment, which is associated with the proton's spin of 1/2. In the H2 molecule, the spins of the two hydrogen nuclei (protons) couple to form a triplet state known as ortho-hydrogen, and a singlet state known as para-hydrogen.

Para-hydrogen is in a lower energy state than is ortho-hydrogen. At room temperature and thermal equilibrium, thermal excitation results in hydrogen that is approximately 75% ortho-hydrogen and 25% para-hydrogen. After hydrogen is cooled and liquified, there is a slow, spontaneous transition to a predominantly para- ratio, with the released energy having implications for storage.

The ratio between the ortho- and para- forms is about 3:1 at standard temperature and pressure—a reflection of the ratio of spin degeneracies. However, if thermal equilibrium between the two forms is established, the para- form dominates at low temperatures (approx. 99.8% at 20 K).

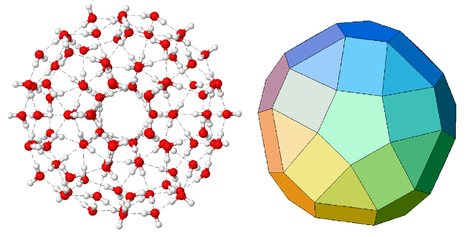
**Isotopes of Water.** Hydrogen (H) has three naturally occurring isotopes, sometimes denoted 1H, 2H, and 3H. Other, highly unstable nuclei (4H to 7H) have been synthesized in the laboratory but not observed in nature. The most stable radioisotope is tritium, with a half-life of 12.32 years.



Hydrogen is the only element whose isotopes have different names that are in common use today. The 2H (or hydrogen-2) isotope is usually called deuterium, while the 3H (or hydrogen-3) isotope is usually called tritium. The symbols D and T (instead of 2H and 3H) are sometimes used for deuterium and tritium.

**Clustered Water Forms.** In chemistry, a water cluster is a discrete hydrogen-bonded assembly or cluster of molecules of water. These clusters have been found experimentally and predicted in computer simulations in various forms of water—in ice, in crystal lattices, and in bulk liquid water, the simplest one being the water dimer (H2O)2.

Ongoing academic research is important because the realization that water manifests itself as clusters rather than as an isotropic collection may help explain many anomalous water characteristics, such as its highly unusual density temperature dependence (it expands when it freezes). Water clusters are also implicated in the stabilization of certain supramolecular structures.



So little is understood about water clusters in bulk water that it is considered one of the unsolved problems in chemistry.

The most common form today is called “activated water,” usually associated with a waterfall. The mechanics actually cause the water to structure itself as H7O9+, plus a free radical ion (-). It is considered the healthiest form of water, and is why we often feel “refreshed” when near a waterfall.

This cluster form can be generated with a negative ion generator. Gilbert Ling, who was a pioneer in this field, discovered that water in human cells is not ordinary water (H2O), but something far more structured and organized.

*I began to think about water in the context of biology: if water inside the cell was ordered and structured and not bulk water or ordinary water as most biochemists and cell biologists think, then it is really important,…*

**Dr. Jerry Pollack**

**The Fourth Phase of Water: Beyond Solid, Liquid, and Vapor**

**Coming Next:**

**Part 2: Jerry Pollack, and the Structure in Water**

Dr. Richard Alan Miller

Physicist and Writer

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