

Water Structure and Science

Liquid water is not a bit player in the theatre of life — it's the headline act

Water science



Water (H₂O) is often perceived to be ordinary as it is transparent, odorless, tasteless and ubiquitous. It is the simplest compound of the two most common reactive elements, consisting of just two hydrogen atoms attached to a single oxygen atom. Indeed, very few molecules are smaller or lighter. Liquid water, however, is the most extraordinary substance.

Although we drink it, wash, fish and swim in it, and cook with it (although probably not all at the same time), we nearly always overlook the special relationship it has with our lives. Droughts cause famines and floods cause death and disease. It makes up over about half of us and, without it, we die within a few days. Liquid water has importance as a solvent, a solute, a reactant and a biomolecule, structuring proteins, nucleic acids and cells and controlling our consciousness. H₂O is the second most common molecule in the Universe (behind hydrogen, H₂), the most abundant solid material and fundamental to star formation. There is a hundred times as many water molecules in our bodies as the sum of all the other molecules put together. Life cannot evolve or continue without liquid water, which is why there is so much excitement about finding it on Mars and other planets and moons. It is unsurprising that water plays a central role in many of the World's religions. This web site discusses many aspects of water

science with the exception of availability, agricultural and environmental issues.

Water properties

Water is the most studied material on Earth but it is remarkable to find that the science behind its behavior and function are so poorly understood (or even ignored), not only by people in general, but also by scientists working with it every day. It can be extremely slippery and extremely sticky at the same time. The small size of its molecule belies the complexity of its actions and its singular capabilities. Liquid water's unique properties and chameleonic nature seem to fit ideally into the requirements for life as can no other molecule.

A number of explanations of the complex behavior of liquid water have been published, many quite recently, with several stirring up great controversy. In this web site, I have attempted to present these ideas in a self-consistent and balanced manner, which I hope will encourage both its understanding and further work.

Source:<http://www1.lsbu.ac.uk/water/index.html>