The Water

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Background

Water played a crucial role in the origin of life and has an essential role in maintaining plant and animal life. Plants depend on water for the transfer of nutrients and photosynthesis. Owing to the presence of water in cells and body fluids such as blood, human beings are approximately 60% water. Nearly all processes essential for life depend on reactions that take place in an aqueous solution. Given the importance of water, it is not surprising that men and women can survive very much longer without food than they can without water.

Water cycle

It has been shown that the total amount of water that falls to the Earth's surface each year is about 496 000 km^3; i.e. approaching 100 x 10^{12} tonnes. About one quarter of this precipitation falls as rain, snow, etc. over the land, and the rest over the seas. The precipitation is balanced by evaporation of an equal amount of water (water that goes up must come down). The changes involved in the continuous process of precipitation and evaporation is called the water cycle (draw a water cycle with processes that you know?).

How does water gets polluted? What is water pollution? What are acid rains? How do we de-pollute water?

H-bonds

Historically the availability of water supplies has determined where villages, towns and other habitations are sited. All these factors and many more make water a substance of great importance. From a strictly chemical point of view the remarkable thing about water is the amount of H-bonding there is, both in the solid and in the liquid. If it were not for the fact that H-bonds are of intermediate strength stronger than van der Waals' bonds but weaker than ordinary ions or covalent bonds then life as we know it could not exist and world would be without rivers, lakes or sea.

From these facts that I presented so far we all knew water very well. Use it. Let it go into the drain after use without much notice. When we pollute it, we get warnings. That's all. Do you think that we know all about of water, and its properties? What is happening in the world right now? Why the interest on research on water itself?

Water 2000

What makes water so weird? It all boils down to molecular clusters and mysterious bonds. These molecules act, as may drunks at a disco grabbing others that passes by. We all owe our existence to the weirdness of water. For example if water behaved like most materials and contracted on freezing rather than expanding, ice would be denser than water and would sink to the seabed. There would be none of the insulating layers of ice that conveniently form on the surface oceans and lakes, allowing marine and aquatic life to survive in the unfrozen