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It is reported that 'WUNDERWASSER' or water found in a cavern in Nordenau, Germany, several years ago is very effective in treating a variety of diseases, as well as traumatic injuries. Clinical improvements have been observed in eighty percent of the patients who took wonder water in Nordenau.

The Hygienics Institute of Gelsenkirchen, however, cannot elucidate as to why the water can bring such wonderful and rapid recoveries from various disorders.

The water was brought to Prof. Shirahata, of Kyushu University ( Laboratory of Cellular Regulation Technology) for investigation.

Let us discuss why the water in Nordenau can be called 'wonder water'.

1. Water consists of solvent and solute.

It is important to recognize that water consists of solvent, or  $H_2O$  and solute or minerals dissolved in the solvent, or  $H_2O$ .

It should also be noticed that the latter could have no significance in the absence of the former. The former, solvent, is the very prerequisite of the latter : solute.

2.  $H_2O$  is a compound of reductants and oxidants.

Hydrogen (H) is an essential reductant. While, oxygen (O) is an essential oxidant.

Therefore, it should be said that solvent or  $H_2O$  is a compound of reductant and oxidant. This kind of standpoint is imperative in the evaluation of water as a whole.

3. Three fundamental conditions of water

It is important to notice that DO(Dissolved Oxygen), DH(Dissolved Hydrogen) and RP(Redox Potential) are three fundamental conditions in the evaluation of water property. Evaluation of water without consideration of the above three conditions will be in vain, which has been the most fatal cause of mistakes made in the investigation of property of water in the past.

#### 4. Characteristics of Reduced Water

Characteristics of Reduced water obtained from electrolysis are as follows :

	DO (ppm)	DH (ppb)	RP (mV)	PH
Original water (tap water)	10.0	2.3 □ 2.6	+652	7.5
Reduced Water	8.6	-690 – 720	-247 	10.3

It must be observed that low DO in our drinking water can be expected to produce a lesser amount of active oxygen species when taken by us.

High DH and negative RP of reduced water is the result of production of atomic as well as molecular hydrogen in the cathodic cell.

#### 5. Active hydrogen in reduced water

Active oxygen species are reckoned to deactivate enzymes in the cells, damage DNA and destroy lipid membranes, which might cause every possible disease.

It could be said that ‘active hydrogen’ should be the ideal antioxidant against active oxygen species.

The existence of active hydrogen in reduced water was proven by Prof. Shirahata.

*(Electrolyzed-Reduced Water Scavenges Active Oxygen Species and Protects DNA from Oxidative Damage, Biochemical and Biophysical Research Communications, 234, 269, 1997.)*

#### 6. Hydrogenase of 3.8 billion years ago

Happe and Bagley reported, ‘Hydrogenases are enzymes that can reversibly split molecular hydrogen....the crystal structure at 2.85 resolution of a Ni/Fe hydrogenase (from the bacterium *Desulfovibrio gigas*) was reported....Ni/Fe hydrogenases are among the oldest enzymes (3.8 billion years old), demonstrating early life forms had developed an effective way to active molecular hydrogen at ambient temperature and pH.... □ *BIOLOGICAL ACTIVATION OF HYDROGEN, NATURE, 385, 126, 1997* □

The above paper implies that early life forms should have developed hydrogenases to produce atomic hydrogen or 'active hydrogen', in order to scavenge active oxygen species which might threaten their existence.

#### 7. Active hydrogen found in water in Nordenau.

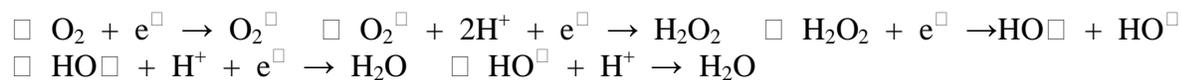
Active hydrogen was shown to exist in water in Nordenau by Prof. Shirahata.

The finding implies that miraculous recovery from a variety of diseases obtained by the intake of water in Nordenau should be brought about by the scavenging ability of the active hydrogen contained in it.

This fact can be supported by the findings in paper of Happe and Bagley, as well.

#### 8. WATER REGULATING THEORY

Living organisms originated in water. This fact implies that necessary conditions for birth and survival of them should exist in water. If not, no living organism could have originated in water. Oxidation by active oxygen species can cause every disease. While, reduction by active hydrogen should bring recovery from it.  $H_2O$  is a compound of redox reaction of H and O, which produces not only  $H_2O$ ,  $O_2$ ,  $H^+$  and  $e^-$  but also  $^1O_2$ ,  $O_2^-$ ,  $H_2O_2$ ,  $HO^{\cdot}$  which regulate life and death of living organisms. Active oxygen species such as  $^1O_2$ ,  $O_2^-$ ,  $H_2O_2$  or  $HO^{\cdot}$  can bring them to sickness, which can be, however, scavenged by active hydrogen, H ( $H^+ + e^-$ ), as shown below.



I proposed the hypothesis 'Water Regulating Theory (Hayashi's Model)', stating that each living organism is regulated by redox reaction in  $H_2O$  (*EXPLORE 6,28-31, 1995*).

Lewis Thomas described, 'For every disease there is a single key mechanism that dominated all others. If one can find it and then think one's way around it, one can control the disorder....'

We are sure that a single key mechanism for getting sick, and the recovery of living organisms should be hidden in water, the place where they originated.

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