

# The Origin of Water via Ionization

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The first water on Earth appeared ~1400 MYA when the oxygen atom acquired electrons and ionized for the first time. Water, a prime necessity for life, is a combination of two elements, oxygen and hydrogen; one atom of oxygen and two atoms of hydrogen. For these two elements to bond, ionization must occur. The ionization potentials (I.P.) and limits for each element are presented in [Table 1 of NBS-34](#). The listing for oxygen has eight energy levels expressed in electron volts (eV) where oxygen has the potential to ionize and be receptive to joining with hydrogen or other elements as follows (notice the large jump between VI and VII):

	I	II	III	IV	V	VI	VII	VIII
Energy (eV)	13.618	35.116	54.934	77.412	113.78	138.116	739.315	871.387

Chemistry indicates oxygen could double bond with oxygen and forms a single gas molecule or forms a single molecule of water with two single bonds with hydrogen.

[The Ionic Growing Earth](#) – 8 Element Supplement posits that 1 eV of energy degrades and converts to mass or entropy every 1.595235million years (MY). Therefore, the first time oxygen ionized and could bond was ~1400 million years ago (1.595235 X 871.367). Notwithstanding oxygen's propensity to double bond with an atom of carbon instead of another atom of oxygen, it is noted carbon did not ionize for the first time until 800 MYA (1.595235 x 489.981). Therefore, carbon was unable to join oxygen and become CO<sub>2</sub> 1400 MYA or even become a hydrocarbon such as methane (CH<sub>4</sub>) until the time of its first ionization some 600 million years later. Thus, water materialized ~1400 MYA. When one reads or hears that water has been present on Earth 2, 3, or 4 billion years ago, simply ask the pertinent question...*how did water form before oxygen ionized and acquired electrons?*

The time of the above ionization potentials (I.P. x 1.595235) in million years is as follows:

	I	II	III	IV	V	VI	VII	VIII
Time (MYA)	21.72	56.02	87.63	123.49	181.51	220.33	1179.38	1390.07

Currently Earth contains about 1,358,000,000 (1.358 E+9) cubic kilometers (km<sup>3</sup>) of water of which about 1.332 E+9 km<sup>3</sup> (0.3 billion cubic miles) is in the oceans. If the Earth was smaller in the past, wouldn't all that water completely cover the surface? It would, except the [Ionic Growing Earth](#) posits that the same elements that started the planet are growing the planet. The oxygen in water is doubling in mass and volume (by convention, water has a density equal to one and a doubling of the mass will double the volume) around every 24 MY (23.774 per Table 2R of the IGE Supplement) and has been doing so for the past 220 MY. Dividing 220 MY by 24 MY results in water doubling in mass 9.1666 times and 2<sup>9.166</sup> indicates there was 574.7 times less water on Earth 220 million years ago (MYA). Since water did not grow between 220.33 MYA and 1179.38 MYA, it is reasonable to assume there was roughly 600

times less water ~1200 MYA. Of course, this only answers the initial ionization, which produced the original water and not any additional water possibly arriving at the times of the five remaining ionization points.

## CONCLUSIONS

Geology established that significant oxygen appeared in the atmosphere ~1700 million years ago. This "Great Oxygenation Event" indicates the formation was in the gaseous state. Water can form when oxygen ionizes in the presence of hydrogen. The determining factor for the arrival of H<sub>2</sub>O or O<sub>2</sub> gas is the time when oxygen acquired electrons and ionization capabilities. That time is shown to be around 1400 MYA.

The time when chemical elements ionize may provide some clues regarding when certain past reactions occurred. Knowing when specific elements ionize could be helpful in the geo-timing of biochemical cycles such as the carbon cycle, the lime cycle, the carbonate-silicate cycle, etc. Knowing carbon first ionized ~800 MYA provides the true **origin of the hydrocarbons** and lends systematic accuracy to the Russian scientists who portray oil as primordial, renewable, and abiotic; i.e. *not* a fossil fuel.

The **origin of water** provides a physics-chemistry based way of viewing the time of past geological events. For example, solid rock did not exist on Earth before the water cycle cooled a molten crust. Geologist, physicists, and others may want to think about the physical state of the crust when dating ancient rocks older than 1400 MYA.