H2S Alive Course Burlington

H2S Alive Course Burlington - Hydrogen Sulfide or H2S is a significant contributor in the biogeochemical cycle of sulfur on our planet. H2S or hydrogen sulfide plays a central role within the sulfur cycle of the Earth.

By reducing elemental sulfur or sulfate to hydrogen sulfide, energy from oxidizing organic molecules or hydrogen is derived without oxygen by sulfate-reducing bacteria and sulfur-reducing bacteria. At this time, other bacteria release H2S from sulfur-containing amino acids. This contributes to the odor of flatulence and is also what causes the "rotten egg" odor. For instance, the black color of pond sludge, is caused by the metal sulfides found within.

In ocean dead zones or in swamps or in eutrophic lakes, organic matter decays under low-oxygen or hypoxic conditions. In order to oxidize the organic matter, sulfate-reducing bacterial will utilize the sulfates found in the water. The end result is producing H2S as waste. Some of the hydrogen sulfide will react with metal ions in the water. This reaction produces metal sulfides that are not water soluble. These metal sulfides, like ferrous sulfide or FeS are usually black or brown and this contributes to the dark color of sludge

H2S can be used as fuel by numerous groups of bacteria. They oxidize it to elemental sulfur or to sulfate by utilizing dissolved oxygen, nitrate as oxidant or metal oxides.

In photosynthesis, H2S is used as an electron donor by both the green sulfur bacteria and the purple sulfur bacteria. This produced elemental sulfur. This form of photosynthesis is in fact older than the form of algae, cyanobacteria and plants. In these cases, oxygen is liberated and water is used as an electron donor.

In some mass extinctions which happened on earth in the past, Hydrogen Sulfide has been implicated. It is believed by some that the Permian-Triassic extinction event 252 million years ago might have been caused by a large buildup of hydrogen sulfide in the atmosphere.

It was indicated that the oceans were anoxic or oxygen-depleted when the organic residues from these extinction boundaries were tested. These oceans had species of shallow plankton which metabolized H2S. H2S formation could have potentially been initiated by enormous volcanic eruptions. These eruptions emitted vast amounts of methane and carbon dioxide into the atmosphere. The oceans were warmed up by this process which in turn lessened their capacity to absorb oxygen that could otherwise oxidize Hydrogen Sulfide.

The ozone layer could have been depleted and the oxygen-generating plants might have been desecrated due to the increased levels of hydrogen sulfide in the ocean. This can also lead to stress. Off the coast of Namibia within the Atlantic Ocean and in the Dead Sea during modern times, small H2S blooms have been detected.