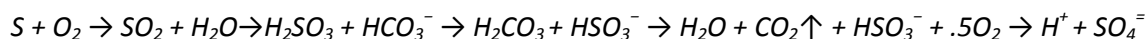


Emulating Volcanism to Create a New Class of Recycled Water

Terry Gong, HSI & ERT, westernso2@aol.com

Volcanoes release significant amounts of sulfur dioxide into the atmosphere and oceans. This phenomenon appears to provide the quintessential chemical reaction that drives all of our planet's ecosystems and all of the life forms that inhabit them. Volcanism is integral to how our planet continuously resets and keeps the elements *hydrogen* (H^+), *oxygen* (O), *sulfur* (S), and *carbon* (C) in a constant state of flux. This chemistry is shown below:



This chemistry illustrates how nature provides the: *acidity* needed to control *pH*; deconstructs chemical compounds; transforms *alkalinity* (*bicarbonates/carbonates*) into *water* (which provides dilution to prevent our planet's oceans from supersaturating and precipitating out of solution); *carbon dioxide* to maintain the atmosphere; *bisulfite*, an inorganic compound and energy source that feeds bacteria (*chemolithotrophs*); and *sulfate*, the nutrient that aids in the formation of amino acids Cysteine and Methionine.

Unlike nature, current wastewater treatment methods use artificial chemicals such as sodium hypochlorite, sodium bisulfite, polymers, ferric chloride, etc., which increase salts, incapable deconstructing chemical compounds, and stresses ecosystems. Nature always has the final say and the near collapse of important aquatic ecosystems such as the San Francisco Bay Delta Estuary, rapid accumulation of salts on our precious farm ground, indicate that our current wastewater processing methods and use of these materials are unsustainable. To become sustainable, we must recognize the integral role volcanism has to our planet. Doing so will help us to better understand how our planet actually works and how to emulate the same chemistry nature uses to process and create a new class of recycled water.

Keywords: Wastewater

Poster Topic: Recycled Water