



MICROBE-LIFT® - H₂S Control Humic Based Technology

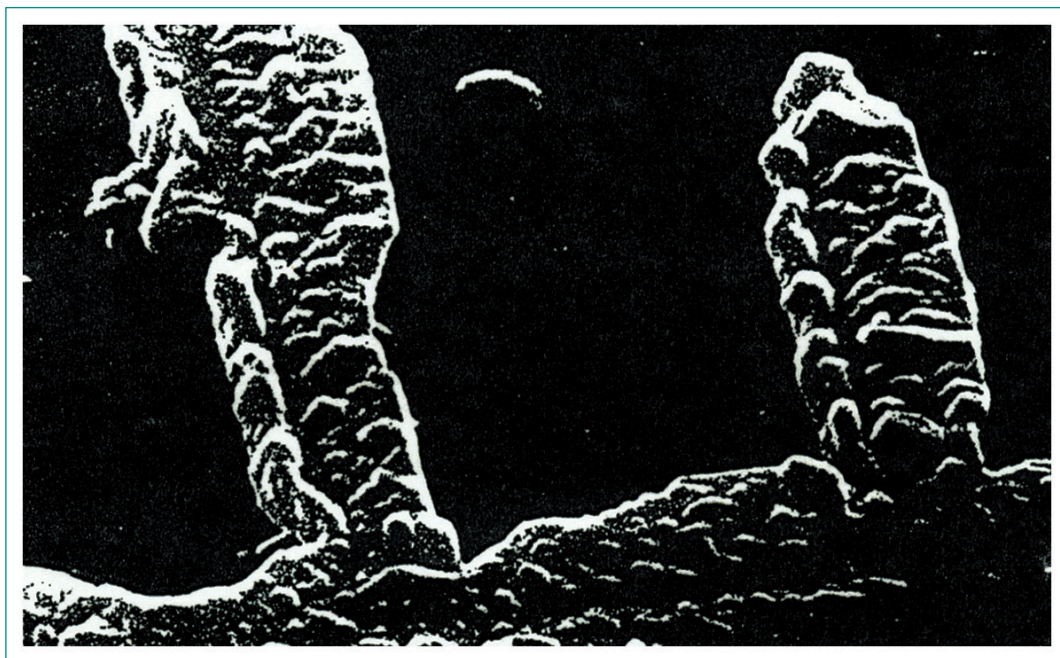
What it is

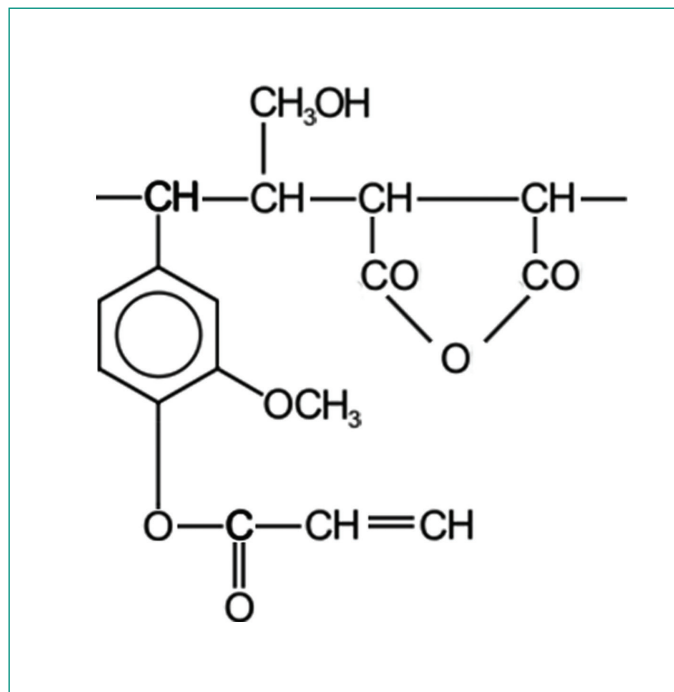
Ecological Laboratories **MICROBE-LIFT®** Humic based products contains humate salts consisting of a composition of humates, humic acids and lignin matter, as well as a wide range of essential organic based building blocks and related acids, derived from an extraction of highly humified organic materials.

These compounds represent essential humic acids, fulvic and ulmic compounds, many of which have their counter parts in all biological tissues. These essential life structural components are known to enhance biological performance in plants and biological processes, as well as targeting the capture of odorous gaseous reactions and interrupting their subsequent corrosive by products.

How it works

The highly "reactive lignins" with 7 to 9 carbon and oxygen open bonding sites per molecule have a reactive surface structure estimated at 900,000 square meters per kilogram and an enormous negative cation exchange capacity of 1500 to 3000 moles per kilogram. These active sites function as a macromolecular sponge, adsorbing, binding and capturing potentially odorous compounds and reacted compounds





The captured compounds form covalent and trivalent chemically bonded, cross-linked polymers. These “captured, adsorbed compounds” are inaccessible for microorganisms to hydrolyze, blocking sulfate reactions, and eliminating odorous gaseous reactions and gaseous productions.

These lignin components are so reactive that they can adsorb approximately 1000 times their own mass in potential gaseous and pollutant compounds. The lignin’s highly reactive structure provides a cost effective, environmentally friendly solution to pollution, odor control and corrosion.

BENEFITS – When Incorporated with MICROBE-LIFT® Select Microorganisms

- Rapid odor reaction, results may be obtained on contact, or within 12 to 48 hours of application – suggest 30, 60, or 90 day trial periods for large systems.
- Eliminates the release of hydrogen sulfide and related corrosion.
- Significantly increases the degradation of organic solids, reduces BOD, and TSS.
- Economical and cost effective, low PPM rate requirements, with application rates as low as 2 PPM following start of treatment at higher rates.
- Stimulates and enhances microbial populations, beneficial to receiving waste water systems.

These Humic substances are highly-abundant organic compounds formed in soils and sediments by the decay of dead plants, microbes and animals. In the natural environment they bind hydrogen ions and metal ions (cations), regulating the chemical reactivity and bioavailability of the cations, and affecting the behavior of humic matter. Humic substances are widely used in soil waters enhancement as a valuable resource for enhanced degradation and odor abatement.

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The Humic acid based technology serves as an H₂S scavenger to reduce the level of hydrogen sulfide within an anaerobic bioactive environment and oxidation process.

The reactive lignin in our Humic acid based material function and act as a macromolecular sponge by absorbing and capturing potentially odorous compound like H₂S and ammonia, the unreactive lignin contains 7 to 9 receptor sites bind odor causing elements.

When combined with Purple Non-Sulfur microorganisms these combined technologies function in synergisms, collection, control and removal similar to how an activated-carbon-pack wastewater system using activated carbon functions, i.e., biologically keeping the bonding site available for continued capture and processing of odors compounds.

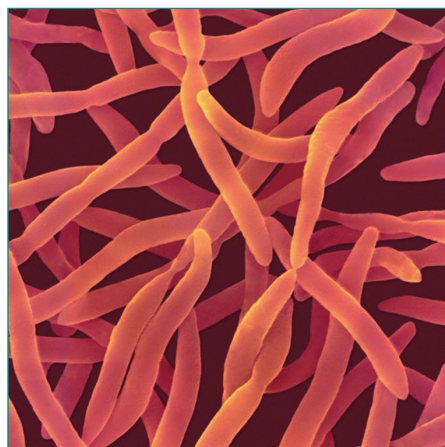
The addition of a nitrate compound in combination with select purple non sulfur cultures and Humic constituents (in an anaerobic environment), adds a preferred biological pathway over that of the sulfate pathway, further controlling H₂S production via a preferred oxidation pathway.

These combined technologies target the reduction of organic line deposition and the biological oxidation of organic deposition within the collection systems where hydrogen sulfide is produced. As the collection systems organic deposition is reduced through biological oxidation a reduction in treatment levels may be achieved.

Benefits of collection system line augmentation often are achieved via in-line bio-film BOD and COD reduction resulting from the development and continued bio film processes on collection system surfaces, where soluble and particulate organic waste matter is biologically reduced.

With continued bio-augmentation at the head of the collection system, bio-films will develop within the entire pipe and will function as a bio generator producing additional microorganisms to seed downstream and result in a continued source of activated microorganisms to the receiving wastewater facility.

Purple Sulfur bacterium, plural Sulfur Bacteria, a diverse group of microorganisms capable of metabolizing



sulfur and its compounds and important in the **sulfur-cycle** in nature. Some of the common sulfur substances that are used by these bacteria as an **energy source** are **hydrogen sulfide (H₂S)**, sulfur, and thiosulfate (S₂O₃²⁻). The final product of sulfur oxidation is sulfate (SO₄²⁻).

ELI's MICROBE-LIFT® Purple Sulfur bacterium oxidize hydrogen sulfide from the water column and metabolize it into granules of elemental sulfur. These sulfur granules are stored temporarily and then oxidized to form sulfate. The sulfur granules can be seen within the bacterial cells at a 1000x wet mount microscopic slide. In high numbers, these bacteria give the water and the floc a pink or purplish tint.

For more information on MICROBE-LIFT® Technology contact

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