



EcoProven Colloidal Chemistry and Implications

Introduction.

In the 1850's colloidal chemistry was discovered, with the primary emphasis of developing oil cleanup products. During the next 120 years very little colloidal chemistry was explored.

The EcoProven product group offers a heavy duty, user friendly, environmentally safe and non-toxic line of cleaning products for commercial use. A biodegradation process results from EcoProven's colloidal chemistry when used with food elements, fertilizers and fatty acids. These products are ingested by the background phytoplankton and zooplankton, respectively, thus completing the final bioremediation into the environment. These newly formulated products are 100% biodegradable and harmless to humans, wildlife or marine life. The EcoProven formula is not corrosive, does not harm gaskets, seals, plastics and leaves no residue. EcoProven contains no hard chemicals, soaps or detergents. EcoProven was developed to fill the need for an environmentally compatible cleaner that is both safe and effective. This cleaning system is totally based on renewable, naturally occurring resources. Unlike "traditional" cleaners based on petroleum derived surfactants, EcoProven is a unique combination of surfactants, colloids and hyper-wetting agents that are sourced and manufactured from renewable, naturally occurring vegetable oils and fats such as coconut, palm kernel, palm and tallow as well as renewable agricultural resources such as corn and soybeans.

Colloidal system

Colloids are charged particles, that in the presence of water break down material into molecules and atoms. The EcoProven proprietary dispersing agents use both ionic bonding and hydrophobic association to suspend the submicroscopic material and keep it from reforming. When breaking down solids into suspension the resultant suspension is known as SOLS. When breaking down liquids to suspension the resultant suspension is known as emulsion. In addition, the oxidation action on hydrocarbon molecules of gasoline, diesel fuel and light oils reduces the molecules to H₂O (water) and CO₂ (carbon dioxide) thus obviating the need for additional treatment.

Colloid (kol'oid) in physical chemistry

A colloid is a gelatinous substance which when dissolved in a liquid will not diffuse readily through vegetable or animal membranes. A colloid can be a solid, liquid or gaseous substance made up of very small, insoluble, non-diffusible particles that remain in suspension in a surrounding medium. All living matter contains colloidal material and a colloid has only a negligible effect on the freezing point, boiling point or vapor tension off the surrounding medium. Colloidal particles are about 10^{-7} to 5×10^{-5} cm in diameter, larger than most inorganic molecules and they remain suspended indefinitely. They are large molecules, as proteins, or group of molecules, with many properties depending upon their large specific surface.

Colloid action

Colloids are electrically charged sub-microscopic particles called micelles. They are microscopic substances (I.E. 1 to 500 milacron's) that possess a very profound ability to reduce or penetrate surface tension. Their physical action is electrical in nature (with each end possessing an opposing charge) that along with its size can easily penetrate certain biological membranes. The charged particles repel each other resulting in random movement, which works to break up oil, water or **fat** molecules among others. They continually pass through other molecules in their path, breaking them apart. To visualize how small these colloidal particles are, if a grain of table salt were the earth, the sub-microscopic micelles would be less than a mile.

Water molecules are attracted to colloids much like a magnetic field. When the attraction of the colloids becomes greater than the force holding the water molecules together, they disperse into individual particles. The power of the colloid is amazing in that it works without the undesirable side effects of petrochemical dispersants. Its colloid super action keeps on working as long as there is even a microscopic amount of water present.

EcoProven colloids are water based, homogenous blends of colloids and other agents uniquely formulated, blended and processed to attain a high degree of activity in fresh or salt water. When properly applied to oil concentrations, their biodegradable surfactants dynamically alter the oil surface tension and the oil is reduced to micro particles that continue to repel each other, preventing them from re-coalescing as a continuous film of oil. This process accelerates the biodegradation of each particle to ultimately attain complete and acceptable dispersion in the environment. In cleaning processes, the cleaner/water mix dynamically alters oils, greases, fats and soils, reducing them to microparticles, which are easy to rinse away.

Colloidal dispersions

A colloidal dispersion is composed of particles that are larger than the tiny units of matter in a solution, but smaller than the relatively large particles of matter in a suspension or an emulsion. The size of a colloidal particle is usually given as lying between about 0.001 and 0.01 micron in their greatest dimension. (a micron is 1/1000 of a millimeter). This is the size that is usually just below the limits of the ordinary optical

microscope. Thus colloidal dispersions appear homogeneous under such microscopes. Molecules usually lie below the smaller colloids. Colloids will not settle out or rise to the top in water. The particles are so small that they are kept evenly dispersed by the motion of the water molecules around them. In this respect they are like solutions, but unlike solutions, colloids do not cause any great change in the chemical nature of the water in which they are dispersed.

Wetting Agent

Surfactant Types

When an ionic **surfactant** or other type of **surfactant** is added to water, the **surfactant** molecules rise to the surface and act as an emulsifier, holding the water and oil together.

About 5% of all of the petroleum production worldwide as of 2003 went to the manufacture of fatty alcohol nonionic **surfactants**, accounting for 212,000,000 metric tons of the compound produced globally. Special anionic **surfactant** compounds known as bio-surfactants are also used in oil spill remediation. A wetting agent is a chemical compound that reduces the surface tension of a liquid. The surface tension of a liquid is the tendency of the molecules of a liquid to bond together and is determined by the strength of the bonds between the liquid's molecules. A wetting agent stretches these bonds and decreases the tendency of molecules to hold together, which allows the liquid to spread more easily across any solid surface.

Wetting agents can also be surfactants, which are a type of chemical that alters the properties of liquids by causing changes to the surface tension of the liquid. Surfactants can also contain dispersants, which are chemicals that separate oil and water, and emulsifiers, which combine oily liquids with water. Wetting agents can be made up a variety of chemicals, all of which have this tension-lowering effect.

When the wetting agent is applied, it causes the liquid to create particles called micelles, which allow the penetration of the solid by the liquid. Micelles are made up of molecules that attract water and molecules that repel water. In water, the micelles assemble in a large cluster where the water-attracting molecules form a ring with the water-repelling molecules in the center. When the wetting agent is used in oily liquids, the structure of the micelle is reversed as the water-repelling molecules are on the outside of the ring because they are attracted to the oily liquid and the water-attracting molecules are repelled by the oily liquid.

Most people come into contact with wetting agents regularly, as many are for personal use. Others, which are not meant for personal use can have much harsher chemical compounds in them. Wetting agents are used in a number of cleaning products, such as detergents, shampoos, conditioners and soaps, which are typically used with water. These chemical compounds are very useful in decreasing surface tension of water and spreading the water over the solid surfaces that it comes into contact with, such as clothing, skin and hair.

Some wetting agents are actually used inside the human body. Laxatives are just one example of a wetting agent used internally. Since dehydration of the intestinal tract can often cause constipation, adding a wetting agent can help solve this problem by applying water to the impacted intestinal material. Toothpaste can also contain wetting agents, although swallowing toothpaste is generally not recommended.

Harsher chemical compound examples of wetting agents may include pesticides, herbicides and insecticides. Wetting agents are used in these products to allow the other harmful chemical agents in these products to penetrate the solid they are applied to. This type of chemical liquid application is also used in paint to decrease its surface tension so it applies more easily to the solid surface being painted.

Conclusion

Most Viruses consist of three key building blocks: ribonucleic acid (RNA), proteins and lipids. A virus-infected cell makes lots of these building blocks, which then spontaneously self-assemble to form the new virus. Critically, there are no strong Covalent bonds holding these units together because the virus is a self-assembled nanoparticle in which the weakest link is the lipid (fatty) bilayer. Harsh chemicals are not needed to split these units apart, so most detergent soaps will dissolve the fat membrane and the virus falls like a house of cards and dies in time. EcoProven's colloidal chemistry is designed to break down the fatty membranes that protect the COVID-19 virus quickly and effectively, thereby creating complete remediation.

EcoProven's colloidal chemistry will also breakdown "synthetic RNA". Processed oil is full of "synthetic RNA". EcoProven was designed to break down both the outer fatty membranes as well as to destroy synthetic RNA. This is another reason we feel that our EcoProven product will destroy the COVID-19 virus.

NO pathogen, virus, bacteria or germ can live in an alkaline environment. Our product concentrate has a pH of 10.4. We do not believe that COVID-19 can live in an alkaline environment this high. When diluted significantly with distilled water (which has a neutral pH), the resultant solution will not have a high enough pH to destroy COVID-19, just based on pH. However, a solution that is 50% distilled water and 50% EcoProven will yield a solution that has a pH of 8.9. This should be an environment that the COVID-19 virus will not thrive in.

Based on science, we believe that we have a viable solution to help with "containment" and prevention of this invasive COVID-19 virus.

Dr. Ricardo Ford
PHD in Biochemistry
California State Polytechnic University