

Glossary

A

Adsorption

The mechanism whereby ions or compounds within a liquid or gas adhere to a solid surface upon contact.

Anion

A negatively charged ion.

B

Biochar

A carbon-rich, porous solid synthesized by heating biomass, such as wood or manure, in a low oxygen environment (that is, pyrolysis).

Biomaterials

Materials derived from plants or animals created for use as sorption materials.

C

Cation

A positively charged ion.

Coagulation

The process of destabilizing a colloid or suspension that unbalances the forces that separate the particles, often by neutralizing the charges on the particles and allowing the particles to clump or settle.

E

Electro precipitation/Electrocoagulation

The use of an electrical current to enhance the coagulation and precipitation of ionic compounds. The electrical current may attract the compounds to an anode or cathode, or create coagulating ions from a sacrificial anode, or both.

F

Flocculation

A process where the suspended particles of a destabilized colloid or suspension form groups or clumps (known as a “floc”). Coagulation and flocculation work together to separate solids and liquids containing colloids and suspensions.

Fluorotelomer substance

A polyfluoroalkyl substance produced by the telomerization process.

H

Head

The part of a molecule that is a charged functional group attached at one end of the carbon chain tail.

I

Incineration

Thermal destruction process typically characterized by oxidation at temperatures in excess of 1,000 degrees Celsius.

Isomers

Chemicals with the same chemical formula, but different molecular structures.

M

Membrane fouling

Loss of production capacity of a membrane due to accumulation of compounds or biogrowth on the membrane.

Micelles

Particles in which long hydrocarbon tails, repelled by the water molecules and attracted to each other, make up the interior, whereas the negatively charged heads coats the surface and interacts with the surrounding water molecules and positive ions (Ege 1999).

Mineralization/Decomposition/Destruction

The breakdown of a chemical compound into its constituent elements and carbon dioxide and water.

O

Organoclays

A naturally occurring clay mineral, which is organically modified to incorporate cations and enhance the sorption capability.

P

Perfluorinated chemical

Subset of PFAS. Have carbon chain atoms that are totally fluorinated. Examples are perfluorooctanoate (PFOA) and perfluorooctane sulfonate (PFOS) (Buck et al. 2011).

Perfluoroalkyl substance

Fully fluorinated alkane (carbon-chain) molecule. They have a chain (tail) of two or more carbons atoms with a charged functional group (head) attached at one end.

Permeate

The water treated by a membrane filtration technology, which has passed through the membrane, and from which PFAS have been removed. The contaminants not passing the membrane accumulating in the filtrate, which also does not pass through the membrane.

Polyfluorinated chemical

Subset of PFAS. Have at least one carbon chain atom that is not totally fluorinated (Buck et al. 2011).

Polyfluoroalkyl substance

The molecule has a non-fluorine atom (typically hydrogen or oxygen) attached to at least one, but not all, carbon atoms, while at least two or more of the remaining carbon atoms in the carbon chain tail are fully fluorinated.

Polymer

Large molecules formed by combining many identical smaller molecules.

R

Reactivation

The process of treating regenerated GAC to restore treatment properties.

Redox

Chemical reduction-oxidation processes and conditions that can result in the alteration of a chemical compound.

Regeneration

The act of restoring some of the sorption capacity of a sorptive media (that is activated carbon or ion exchange) by removing the adsorbed matter. For carbon, regeneration is a thermal oxidation process.

S

Stabilization

A process to reduce mobility of compounds in the environment through physical or chemical means.

T

Tail

the part of a molecule that is a chain of two or more carbon atoms.

Thermal Desorption

Thermal treatment process intended to remove the contaminants from a solid media (such as soil, sediment, carbon) and drive them into the vapor phase.

Z

Zwitterion

An ionic compound containing both positively and negatively charged groups with a net charge of zero.