The Facts About Activated Carbon

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remove harmful aquarium pollutants

Activated carbon is a popular and beneficial filter media choice for both freshwater and saltwater aquarists. The most common form is granulated activated carbon (GAC), a coal-based form resembling small pebbles or rocks. GAC comes in two varieties, bituminous and lignite, but it is the higher-quality bituminous version that is primarily used in aquariums. It is referred to as "activated" because it has undergone a process that creates millions of tiny holes in the carbon, making it extremely porous and conducive to growing bacteria for better chemical reactions.

how activated carbon works

Whereas the ocean is large enough to recycle organic waste naturally, aquariums need our assistance to keep the water clean and healthy. This is where activated carbon comes in. In addition to protein skimmers and other filter media, activated carbon is a useful tool to help keep aquarium water clear and safe.

Activated carbon relies on three chemical principles to work: adsorption, absorption, and chemisorption. When placed in aquarium water, activated carbon relies on a law of physics called van der Waals forces to draw or absorb the harmful pollutants and organics (adsorbents) into the porous carbon. Two things then occur; bacteria then begin to colonize on the surface of the carbon and consume the adsorbents transferred there, and chemical reactions take place within the carbon to detoxify the trapped pollutants.

A third process, called chemisorption, keeps the pollutants trapped in the carbon until it is ready to be replaced.

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benefits and considerations

Activated carbon removes a variety of pollutants from your aquarium water, including copper, chlorine, dissolved proteins, medications, and other organic and inorganic compounds, such as gelbstoff (organic compounds that yellow aquarium water).

To ensure optimal activated carbon performance, pre-filter your aquarium water and replace the carbon every 4-6 weeks, or sooner if needed.

Since all carbon leaches phosphate, it is important to choose a high-quality activated carbon that will release minimal phosphate, such as Black Diamond Premium Activated Carbon. It may also be helpful to choose a combination product, such as Fluval Zeo-Carb, which pairs activated carbon with zeolite to also filter out ammonia.

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