



DID YOU KNOW...

WHAT IS ACTIVATED CARBON?

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Activated carbon, also called activated charcoal, is a form of carbon that has been processed with oxygen to create millions of tiny pores between the carbon atoms. This increases the surface area of the substance from 500 to 1500m²/g, or 300-2,00 square meters per gram. One pound of activated carbon has the surface area equivalent of six football fields.

The increased surface area of activated carbon makes the material suitable for adsorption, a process by which impurities in substances such as fluids, vapors or gas are removed. Impure molecules are held within the carbon's internal pore structure by electrostatic attraction or chemisorption. The adsorption process helps carbon reduce dangerous matter, activate chemical reactions, and act as a carrier of biomass and chemicals.

Activated carbon is usually made from charcoal, but can be produced from wood, peat or even coconut shells. There are over 150 grades of activated carbon, each with their own uses and applications. Commercially, there are three major product groups:

- Powdered activated carbon; particle size 1-150 µm
- Granular activated carbon, particle size 0.5-4 mm
- Extruded activated carbon, particle size 0.8-4 mm

The pore size distribution is highly important for the practical application. Ideally, the carbon material used should have a pore structure that is larger in size than the material it is trying to adsorb. The best fit depends on the compounds of interest, the matrix (gas, liquid) and treatment conditions.

According to the International Union of Pure and Applied Chemistry, there are three distinct groups of pores:

- Macropores (> 50 nm diameter)
- Mesopores (2-50 nm diameter)
- Micropores (< 2 nm diameter)

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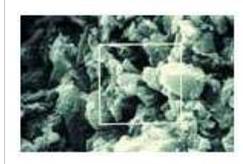
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Micropores generally contribute to the major part of the internal surface area. Macro and mesopores can generally be regarded as the highways into the carbon particle, and are crucial for kinetics. Macropores can be visualized using scanning electron microscopy.

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