

# Activated carbons

At first glance, all types of activated carbon seem alike. They all derive from the same element, carbon. They are used for their ability to absorb and to remove undesired substances from gases and liquids. However, there are activated carbons which may be more effective depending on the application. Undoubtedly, this is due to numerous factors but determinant is the technical competence of the people involved in optimizing the procedures.

Our main objective has been to single out from amongst the various categories of carbons, those which are more suitable to a particular application, experimenting with powdered or granular products activated physically or chemically, successfully obtaining the most appropriate alternative. Even the experience we have gained from helping customers to individualize the best solutions to their problems has been determinant. We can safely state that our competency in resolving any type of problem of adsorption is indisputable.

## *Greater adsorption capacity, better product quality*

Activated carbons are chemically inert industrial products (essentially composed of carbon), with a highly developed porous structure. They have a very large surface area providing superb conditions for adsorption to occur in comparison to a number of other substances. In general, the pore volume is superior to 0.8 ml/g and the surface area is superior to 1000 m<sup>2</sup>/g. Pores have variable dimensions and are classified into three categories:

- **Macropores:** Macropores have a diameter superior to 500 Angstrom. Not all of their pore volume may be available for adsorption and therefore, they do not have a high adsorption capacity.
- **Mesopores:** Mesopores are also known as transition pores and have a diameter between 30 and 500 Angstrom. They are the main means of access and have a fundamental role in adsorption kinetics.
- **Micropores:** Micropores have a diameter between 5 and 30 Angstrom. They are the essential and active part of the surface area.

Adsorption is the adhesion of molecules in a dissolved phase (liquid or gaseous) to the surface area of a solid. This process creates a film of adsorbate (the molecules or atoms being accumulated) on the surface of the adsorbent. It is a consequence of a field of attraction, of surface energy. The forces that bring about the binding of molecules to the surface of carbon are relatively weak. They are "Van Der Waals forces" and create, after a given length of time, an equilibrium dependent on the temperature and the composition of the molecules in their liquid or gaseous phase. We can define the "isotherm of adsorption" as the curve that represents, at a constant temperature, the quantity of substances adsorbed by the carbon in function of the concentration of free molecules, in the fluid, in contact with the adsorbent material.