zeta potential measurement ?

Many of the important properties of colloidal systems are determined directly or indirectly by the electrical charge (or potential) on the particles. Adsorption of ions and dipolar molecules is determined by, and also determines, this charge and potential distribution. The potential distribution itself determines the interaction energy between the particles, and this is in many cases responsible for the stability of particles towards coagulation and for many aspects of the flow behaviour of the colloidal suspension. It is also possible to correlate the zeta potential with the sedimentation behaviour of colloidal systems and with the flotation behaviour of mineral ores.

Since much of the theoretical basis of colloid chemistry demands a knowledge of the potential distribution around the particles, it is essential that we have access to accurate knowledge of that potential.

The most important techniques used to acquire information about these potentials are

(i) the measurement of volta potential differences in surface chemistry and (ii) the measurement of zeta potential. Despite the very real limitations of both of these procedures they remain the most valuable ones we haw at present.

There are many situations in which the zeta potential is used as a parameter in its own right characterizing the outer, diffuse part of the double layer and hence valuable for discussing the interaction between particles or the flow of liquid through membrane pores or porous plugs. There are other situations in which one wishes to construct a picture of the charge and potential distribution across the entire interfacial region, and in this case potential values may be taken as part of the input information.

There are also many situations, especially in the field of biochemistry, in which one is more interested in separating a complex mixture of components with differing mobilities rather than in attempting to understand those mobilities in a fundamental way.

(Equations: smoluchowski, Huckel, Henry, O'Brien)

The ZETACOMPACT and the ZETAPHOREMETER are instruments for zeta potential measurement

CAD Instrumentation (France) Tel: 33(0) 134849394 Fax: 33(0)134846644

The electrophoresis

If one phase consists of a liquid or gas in which the second phase is suspended as particles of solid or liquid, then the particles can be induced to move by applying an electric field across the system. This is called electrophoresis. Measurements of the velocity of the particles under a known external field gives information about their net electric charge, or their surface potential with respect to the bulk of the suspending phase

Streaming potential

Instead of applying an electric field to cause liquid to move through a capillary or porous plug, one can force the liquid through under a pressure gradient. The excess charges near the wall are carried along by the liquid and their accumulation down-stream causes the buid-up of an electric field which drives an electric current back (by ionic conduction through the liquid) against the direction of the liquid flow. A steady state is quickly established, and the measured potential difference across the capillary or plug is called the streaming potential. It is related to the driving pressure and to the potential in the neighborhood of the wall.

The ZETACAD is a new system for streaming potential measurement.

Don't hesitate to contact CAD Instrumentation to have more information

cad@cad-inst.com