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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 32671.1-2016

**Colloidal systems -- Methods for zeta potential determination --
Part 1: Electroacoustic and electro-kinetic phenomena**

胶体体系zeta电位测量方法 第1部分：电声和电动现象

(English Translation)

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Foreword

GB/T 32671 "colloidal system zeta potential measurement method" is divided into the following parts.

Part 1. electroacoustic and electrical phenomena Part 2. Optical method Part 3. Acoustics
this part is part 1 of GB/T 32671.

This part is drafted in accordance with the rules given in GB/T 1.1-2009.

This part uses the translation method equivalent to ISO 13099-1:2012 "Colloid system zeta potential measurement method Part 1. Electroacoustic and Electric phenomenon".

This part is presented by the Chinese Academy of Sciences.

This part of the National Standardization Technical Committee for Nanotechnology (SAC/TC279) and the National Particle Characterization and Separation and Screen Standardization Technology (SAC/TC168).

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Introduction

This section describes the basic theory of electric and electroacoustic phenomena in suspensions, emulsions or porous systems.

From the treatment of domestic sewage or industrial wastewater to the preparation of stable drug suspensions and other processes, have benefited from the surface charge of the particles Understanding of the phenomenon. In addition, the mechanism of mineral flotation is also based on the affinity of the target mineral particles to the bubbles. From a technical point of view, electricity Dynamic and electro-acoustic measurements provide extremely useful and informative information in many cases, and the following are some of the most important applications.

- a) determine the isoelectric point by the electric titration of the ion that determines the potential;
- b) Determination of isoelectric points by titration with other reagents such as surfactants or polyelectrolytes;
- c) determine the adsorption saturation platform, indicating the best amount of dispersant;
- d) relative comparison of surface electrical properties of various systems.

The zeta potential is the potential difference between the slip plane and the body liquid, and the zeta potential can be used to explain and determine some of the suspension the stability of the system interval. By determining the isoelectric point, the best conditions for particle flocculation before filtration or precipitation can be obtained, thus facilitating the treatment of the effluent.

But the zeta potential is not a direct measure of the amount that it needs to be obtained indirectly by establishing some appropriate theory.

This section refers to the technical report of the International Federation of Pure and Applied Chemistry (IUPAC) on the measurement and interpretation of electric phenomena and some General references [1 ~ 5].

Colloid system zeta potential measurement method Part 1. electroacoustic and electrical phenomena

1 Scope

This part of GB/T 32671 specifies the use of electrical and acoustic methods in dispersions, emulsions, porous fluids containing liquid dispersion media Materials and other non-homogeneous system in the determination of zeta potential method.

This method does not limit the zeta potential and the mass fraction of the dispersed phase, suitable for dilution and concentration systems; particle size and porosity Inch is limited to the order of micrometers or less, and the geometry of the particles and pores is not limited. This part does not include zeta potential measurements on the plane Quantity method.

The liquid dispersion medium may be an aqueous phase or a nonaqueous phase having an arbitrary liquid conductivity, a dielectric constant or a chemical composition;

Itself can be conductive or non-conductive; double layer can also be separated from each other, double layer thickness or other properties are not limited.

This part applies to the linear effect in the electric field and assumes that the surface charge is evenly distributed along the interface.

This section does not apply to the effects associated with soft surface layers containing space charge distributions.

2 Terms and definitions

The following terms and definitions apply to this document.

Double electric layer electricdoublelayer Note. Electric double layer refers to when an object is in contact with the liquid, the charge is distributed in the space near its surface and surface.

2.1.1

Debye - Hockel approximation Debye-Hückelapproximation the electric double layer has a small potential difference when the model.

2.1.2

Debye length Debyelength K^{-1} Characteristic Length of Double Electrode in Electrolyte Solution.

Note: The unit is nano (nm).

2.1.3

Diffusion coefficient Mean Displacement of Particle Motion in Unit Time.

2.1.4

Dukhin number Dukhinnumber Du the dimensionless number reflects the contribution of surface conductivity to electrical, electroacoustic phenomena and multiphase conductivity and dielectric constant.

2.1.5

Dynamic viscosity