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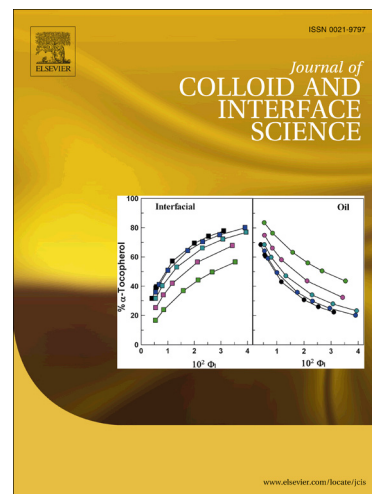
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Adsorption of carboxymethyl cellulose on alumina particles**Alexandar M. Zhivkov, Rosen P. Hristov***“Rostislav Kaishew” Institute of Physical Chemistry, Bulgarian Academy of Sciences**Acad. G. Bonchev Str., bl. 11, Sofia 1113, Bulgaria,**E-mail: zhivkov_ipc@doctor.bg***Abstract**

The polyelectrolyte adsorption on colloid particles is often used for stabilization or flocculation of water suspensions. The aim of this work is to study the adsorption of carboxymethyl cellulose (CMC) on alumina ($\gamma\text{-Al}_2\text{O}_3$) colloid particles. The particles and polymer are chosen because of the capability of the metal-oxide ampholyte surface and the weak polyelectrolytes to alter their charge by pH. The measurements are done at pH 6.0 where the CMC carboxylic groups are almost fully dissociated and the alumina surface is positively charged. The high linear charge density of the polyelectrolyte chain provides Na^+ counterions condensation on the COO^- groups. The main employed method is the electric light scattering based on particle orientation in sinusoidal electric field. The electric polarizability and the relaxation time after field switching off (both depending on the particle charge and size) are used as criteria for polymer adsorption and particle aggregation. Micro-electrophoresis is applied as additional techniques indicating the sign and density of the surface charge. The results obtained give the conditions (time dependence, particle and polymer concentrations) where the CMC adsorption is complete and the suspension is stable.

Key Words: *Carboxymethyl cellulose; Alumina particles; Polymer adsorption; Electric light scattering; Electrophoreses.*

1. Introduction

Adsorption of water soluble charged polymers (polyelectrolytes) on colloid particles attracts the attention of many researchers due to their various practical applications – stabilization or flocculation of suspensions in biological, medical and chemical industrial processes [1], gene therapy [2], modification of surfaces aiming to change their adhesion properties, fabrication of nanomaterials [3], etc.

Our purpose is to study the electric properties of colloidal particles encrusted with adsorbed polyelectrolyte chains and the stability of the suspension as well. To have possibility to

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