



## **Influence of the type of aqueous sodium silicate on the stabilization and rheology of kaolin clay suspensions**

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### **Abstract**

To avoid agglomeration and sedimentation of grains, ceramic slurries should be modified by stabilizers in order to increase the electrostatic interactions between the dispersed particles. In this study we present the spectral analysis of aqueous sodium silicates obtained by different synthesis methods and their influence on the rheological properties of kaolin based slurries. Infrared and Raman spectra can be used to describe the structure of silicate structural units present in aqueous sodium silicates. It was confirmed that the best stabilization results possess aqueous sodium silicates of the silicate moduli of about 2 and the optimal concentration of the used fluidizer is 0.3 wt% to the kaolin clay dry mass. One of the most important conclusions is that the synthesis method of the fluidizer has no significant effect on its stabilization properties but used medium does create adequate stabilization mechanism depending on the silicate structures present in the sodium silicate solution.

**Keywords:** Aqueous sodium silicates, Kaolin, Rheology, Silicate modulus, Stabilization.

### **1. Introduction**

Aqueous solutions of alkali silicates, because of their good water solubility, are called soluble silicates or more often water glasses. They are the basic raw materials inter alia for ceramics, glasses, cements and moulds in foundry industries. Because of their lack of toxicity, they can be also used as corrosion inhibitors, cleaning agents or components of ceramic paints. However, due to the low stability of the silicate ions and their varying degree of condensation, they are difficult to investigate. Previous studies indicate that their properties largely depend on their synthesis method [1-3]. In this article, aqueous sodium silicates of different silicate moduli (molar ratio of silica to sodium oxide) and various methods of preparation were investigated for their use as fluidizers of ceramic slurries.

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