

## Synthesis of faujasite zeolite and studing of its microcrystals

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**Abstract:** Hydrothermal synthesis of faujasite type zeolite in a short crystallization period could be performed by preparing a fresh aqueous nucleation solution mixed with an aluminosilicate gel into a teflon tube placed in the stainless-steel microautoclave. Effects of source of silica, sodium silicate, and colloidal silica and also aging of nucleation solution were examined to prepare a highly crystalline and pure faujasite. in all experiments composition of the final gel was  $3\text{Na}_2\text{O}, 1\text{Al}_2\text{O}_3, 10\text{SiO}_2, 160\text{H}_2\text{O}$ . Methods of X-ray Diffraction, Scanning Electron Microscopy, Energy Dispersive X-ray spectrometry associated with SEM, infrared spectroscopy and Thermogravimetric Analysis were used to study the crystallinity and related properties. UV-VIS spectroscopy were used to study the nucleation solution. Ultra-fine and pure ctystals of faujasite were obtained from a nucleation solution prepared from Al, NaOH and colloidal silica. Average crystal size was  $1\mu\text{m}$  and calculated unit cell formula was  $\text{Na}_{49}[(\text{AlO}_2)_{49}(\text{SiO}_2)_{143}].255\text{H}_2\text{O}$  Solid phase materials precipitated from the aqueous nucleation solution after seven days, examined by X-ray diffraction showed broaded peaks of faujasite. This supports the hypothesis that crystallization may originated form liquid phase.