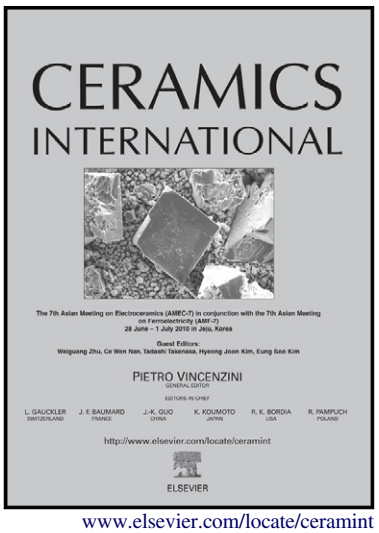


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# Synthesis and characterization of ultrafine sub-micron Na-LTA zeolite particles prepared via hydrothermal template-free method

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**Abstract**

Ultrafine sub-micron Na-LTA zeolite crystals ranging from 150 to 350 nm were synthesized without template via hydrothermal method. Aluminum iso-propoxide and colloidal silica were used as Al and Si sources respectively to synthesize the small and uniform zeolite crystals. Zeolite Na-LTA was synthesized hydrothermally from a gel formula of 1.0 $Al_2O_3$: 2.7 $SiO_2$: 5.85 $Na_2O$: 150 $H_2O$in molar basis. The crystallization conditions including synthesis time, and synthesis temperature were optimized to reduce the zeolite particle size. The final crystals were characterized by X-ray diffraction (XRD) and scanning electron microscopy (SEM). The results confirmed that synthesis temperature should be lowered for better control of the crystal growth. On the other hand, at low synthesis temperatures, synthesis time should be extended to acquire the high crystallinity. Ultrafine sub-micron Na-LTA zeolite crystals were synthesized at synthesis temperature of 60 ℃ and synthesis time of 11 h.