

A Facile Low Temperature Synthesis of Nanostructured Silica Powders from Na_2SiO_3 Waste Solution
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A convenient synthesis as well as distinctive structure provides silica sol-gel materials suitable for a wide range of applications. In this work a facile route has been developed, at ambient pressure and temperature; to synthesize silica nanostructured powders, from Na_2SiO_3 , a waste derived from alkali fusion of zircon. Non-aggregated silica was prepared by sol-gel technique via acid-catalyzed hydrolysis. The influence of the concentration of the reagents on the size of final silica was evaluated. Silica powders with spherical morphology and diameter between 0.1 and 5 μm were achieved. The particles were examined by SEM and the specific surface was determined by BET method. High surface area (276.26 to 961.54 $\text{m}^2\cdot\text{g}^{-1}$) was obtained. This route possesses advantage over known method for synthesis of silica from aqueous alcohol solution of silicon alkoxides; it is low cost and environment friendly, since it employs a waste matter of zircon processing as raw material.