عنوان مقاله:

Preparation and Characterization of SiO۲-CaCl۲ Nanocomposite by the Sol-Gel Method

محل انتشار:

ماهنامه بین المللی مهندسی, دوره 22, شماره 3 (سال: 1388)

تعداد صفحات اصل مقاله: 7

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خلاصه مقاله:

The SiO۲-CaCl۲ hybrid porous materials were prepared by the sol-gel method. This process was conducted by the hydrolysis and condensation of Tetraethyl orthosilicate (TEOS) by replacement of ethanol from alcogel and drying at the ambient temperature to obtain xerogel structure. The alcogel samples were synthesized from TEOS, EtOH, H۲O, HCl, NH۴OH and CaCl۲, while the total molar ratio of the compounds was ۱: ۹: ۴: ۸ x ۱۰-۴, ۸ x ۱۰-۳, respectively. Xerogel containing ۳۰ wt % of CaCl۲ (dry matter) was prepared and characterized by Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), Furier Transmittance Infra Red spectrum (FT-IR), Energy Dispersive X-ray (EDX) and Thermal Gravimetric Analysis (TGA) systems. The results obtained from SEM and EDX showed the micrograph of CaCl۲ on the silica and chemical elemental analysis, respectively. On the other hand, The TEM micrograph confirmed average particle size of SiO۲-CaCl۲ about ۵۰ nm and FT-IR spectrum described the functional groups of the nanocomposite. The thermal analysis of SiO۲-CaCl۲ nanocomposite was performed using TGA system and the results showed that the suitable temperature for initial thermal treatment was about ۲۰۰°C.

کلمات کلیدی:

Synthesis and Characterization, Sol Gel Process, Nanocomposite