

عنوان مقاله:

Synthesis of Bioactive Glass using Cellulose Nano Fibre Template

محل انتشار:

اولین همایش بین المللی علوم و فناوری نانو (سال: 1399)

تعداد صفحات اصل مقاله: 9

نویسندگان:

SH M Sarmast - *Department of Chemical and Environmental Engineering Faculty of Engineering, Universiti Putra Malaysia, ۴۳۴۰۰, Serdang, Selangor*

S George - *Department of Chemical and Environmental Engineering Faculty of Engineering, Universiti Putra Malaysia, ۴۳۴۰۰, Serdang, Selangor*

C. AB Dayang Radiah - *Department of Chemical and Environmental Engineering Faculty of Engineering, Universiti Putra Malaysia, ۴۳۴۰۰, Serdang, Selangor, Safety Engineering Interest Group*

N Abdullah - *Department of Chemical and Environmental Engineering Faculty of Engineering, Universiti Putra Malaysia, ۴۳۴۰۰, Serdang, Selangor*

خلاصه مقاله:

Bioactive glass is one of the biomaterials that is used as a bone graft. The important property desired for a bone graft material is to have well suited porosity to enable cell penetration and enhance oxygen and nutrient exchanges. The common methods to produce bioactive glass are melting and sol-gel methods. Melting method is operated at a temperature higher than 1300 °C; the sol-gel method, on the other hand, is usually operated at a much lower temperature, i.e. in the range of 600– 800 °C. The objective of this study is to evaluate the effect of using cellulose nano-fiber (CNF) template on the properties of the synthesized bioactive glass. Hypothetically, the templating process will create channels within the bioactive glass structures, which improves both its porosity and the interstitial network. In this study, SiO₂-CaO-P₂O₅-Na₂O bioactive glass (BG) was prepared via sol-gel method. The effects of the manipulated parameters on the morphology, chemical properties, porosity and crystallinity of BG were assessed by scanning electron microscopy (SEM), Fourier-transform infrared spectroscopy (FTIR), Brunauer-Emmett-Teller (BET) analysis, Energy dispersive X-ray (EDX) analysis and X-ray diffraction (XRD). It was found that the sintering temperatures significantly affect the structure and performance of samples. The best property was obtained by sintering bioglass with 10 wt% of CNF at 750 °C.

کلمات کلیدی:

Bioactive glass; Sol-gel; Bio-templating, Cellulose nano-fiber, Sintering temperature

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