

**FABRICATION OF MONTICELLITE-AKERMANITE NANOCOMPOSITE
POWDER FOR TISSUE ENGINEERING APPLICATIONS**

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Abstract:

Mechanical activation (MA) is an efficient method to synthesize nano-structured materials. This is the first report of successful synthesis of monticellite- akermanite nanocomposite from talc, calcium carbonate and magnesium carbonate powders. The raw materials were milled for 10 minutes, 2, 5, 10, and 20 hours and then annealed in order to obtain monticellite- akermanite nanocomposite powder. The obtained powder was characterized by X-ray diffraction (XRD) and scanning electron microscopy (SEM). The results indicated preparation of monticellite- akermanite nanocomposite powder with crystallite sizes about 30.76 ± 0.47 nm after 20 h mechanical alloying and sintering at 1200°C for 1 h. Absence of enstatite, a phase that causes a reduction in mechanical and bioactivity properties, is an important feature of the prepared powder. The compacted samples of fabricated nanocomposite powder, sintered at 1300 °C for 3

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