

Preparation and characterization of hydroxyapatite from black tilapia fish scales using spray-drying method

ABSTRACT

Black tilapia (*Oreochromis mossambicus*) fish scales were used as a source of natural hydroxyapatite (HAp) since it is cheaper than synthetic hydroxyapatite and safer than animal origin such as bones. This study investigates the preparation of natural hydroxyapatite from tilapia fish scales (FsHAp) by thermal technique followed by ball milling and spray dried to produce FsHAp powder. The effect of milling time on the particles size of FsHAp was investigated. In this study, Mastersizer 2000 was applied to measure the particles size of FsHAp. Field emission scanning electron microscope (FESEM) was used to investigate the morphology of the FsHAp powders whereas x-ray diffraction (XRD) and Fourier transform infrared (FTIR) were used to verify the presence of FsHAp. From the experimental results, it was found that the optimum milling time is 48 hours which produced smallest particles of FsHAp at about 1.86 μm . The spray-drying method produced different sizes of FsHAp ranging from 2.18 micron to 6.36 μm . The FESEM analysis revealed that the FsHAp particles agglomerated in the spray dryer. FTIR and XRD analyses have showed the prominent peaks corresponding to high quality of FsHAp from fish scales.

Keyword: Hydroxyapatite; Spray dry; Fish scales