Comparison of poly-ethylene glycol effect on hydroxyapatite morphology produced into different method : sol-gel and precipitation

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**Abstarct:**

Hydroxyapatite (HA) can be used as a bioceramic due to its bioactivity and osteoconductive properties. It is clear that the morphology of HA crystal can affects on its specifications such as surface, bioactivity and so on. Because of importance of morphology, in the current research nano sized HA particles were produced using sol-gel and precipitation methods and to change the morphology poly-ethylene glycol (PEG) was used as an organic modifier. The produced samples were characterized using X-ray powder diffraction (XRD) and Scanning electron microscopy (SEM) and transmission electron microscopy (TEM). The results of XRD spectrum show that the pure HA can be produced using two methods. Microscopic evaluations prove that the presence of PEG has a significant effect on HA morphology. Indeed PEG changes the morphology of HA produced by precipitation method to irregular whereas in sol-gel method its shape leads toward fibrous with high aspect ratio. The exact reason of this variation can be attributed to the difference at mechanism of HA growth in two methods.

Keywords: sol-gel, precipitation, hydroxyapatite, PEG, morphology