

## Ceramic Composites and Its Applications for Pb Adsorption

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**Abstract :** Surface functionalization of ceramic composites with a special focus on tetraethyl orthosilicate (TEOS) and hydroxyapatite (HAp) is discussed. Mesoporous ceramic HAp-TEOS composites were prepared by the incorporation of hydroxyapatite into tetraethyl orthosilicate by sol-gel method. The resulting samples were analysed by X-ray diffraction (XRD), scanning electron microscopy (SEM), transmission electron microscopy (TEM), Fourier transform infrared (FT-IR) spectroscopy, and Raman spectroscopy and nitrogen physisorption. The removal of Pb<sup>2+</sup> ions from aqueous solutions was evaluated using Atomic Absorption Spectroscopy (AAS). Removal experiments of Pb<sup>2+</sup> ions were carried out in aqueous solutions with controlled Pb<sup>2+</sup> at pH ~ 3 and pH ~ 5. After removal experiment of Pb<sup>2+</sup> at pH 3 and pH 5, porous hydroxyapatite nanoparticles is transformed into PbHAp\_3 and PbHAp\_5 via the adsorption of Pb<sup>2+</sup> ions followed by the cation exchange reaction. The diffraction patterns show that THAp nanoparticles were successfully coated with teos without any structural changes. On the other, the AAS analysis showed that THAp can be useful in the removal Pb<sup>2+</sup> from water contaminated.

**Keywords :** teos, hydroxyapatite, environment applications, biosystems engineering

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