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RECYCLING: REDUCE, REUSE & RECYCLE November 06-08, 2017 | Las Vegas, USA**Preparation of hydroxyapatite from industrial waste phosphogypsum by hydrothermal method: Its application in wastewater treatment****Hiba Bensalah^{1,2}, Maged F Bekheef², Saad Alami Younssi¹, Mohamed Ouammou¹ and Aleksander Gurlo²**¹University Hassan II of Casablanca, Morocco²Technische Universität Berlin, Germany

Phosphogypsum (PG) is an industrial waste derived from the production of phosphoric acid where the phosphate ore is dissolved in sulfuric acid. About 5 tons of phosphogypsum are produced for every ton of P_2O_5 manufactured. Worldwide PG production is huge and it is estimated that 200000 tons are produced annually in phosphoric acid plants. In fact, 85% of the worldwide production remains at present stored into piles near the factory that occupy considerable land resources or completely discharged into water which lead to serious contamination. In consequence, valorizing and minimizing the negative effects of this hazardous waste increasingly grab the attention of researchers all around the world. In the present work, the conversion of an industrial sub-product phosphogypsum (PG) into hydroxyapatite (H-Ap) was investigated. Hydrothermal synthesis was applied by reacting PG with a salt at different times, temperatures while adjusting pH using sodium hydroxide solution NaOH (1M). The obtained H-Ap exhibited a hexagonal structure, a high purity and nanorod-like shaped of 44×12 nm. The prepared nano-hydroxyapatite was characterized by X-ray diffraction (XRD), Fourier transformed-infrared spectroscopy (FT-IR) and transmission electron microscopy (TEM) and scanning electron microscopy (SEM). The findings showed that PG recycling could be accomplished using an easy synthesis route with relatively cheap reactants in order to produce nano-crystalline H-Ap. The elaborated hydroxyapatite powder was used as an effective adsorbent of organic dyes/heavy metals from wastewater.

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