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**SYNTHESIS OF FePO_4 LOADED WITH TRANSITION METAL
USING IMPREGNATION METHOD FOR REMOVAL OF
HEXAVALENT CHROMIUM**

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HEXAVALENT CHROMIUM**

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ABSTRACT

SYNTHESIS OF FePO₄ LOADED WITH TRANSITIONAL METAL USING IMPREGNATION METHOD FOR REMOVAL OF HEXAVALENT CHROMIUM

The release of hexavalent chromium Cr(VI) from anthropogenic processes into freshwater and marine environments represents a significant risk to both environmental and human health, due to its high toxicity and cancer-causing properties. In this work, iron phosphate (FePO₄) was loaded with transition metals like Cobalt (Co), Copper (Cu), Zinc (Zn) and silver (Ag) by the impregnation method to increase the photocatalytic activity of the material to reduce harmful Cr(VI) under visible light irradiation. The prepared photocatalysts were characterized using ultraviolet visible diffuse reflectance spectroscopy (UV-Vis DRS), Fourier transform infrared spectroscopy FTIR, and field emission scanning electron microscopy (FESEM). The result demonstrated that cobalt loaded on FePO₄ (Co/FePO₄) had the highest photocatalytic activity of 50.42 % removal of Cr(VI). The enhanced photocatalytic performance of Co/FePO₄ is attributed to the strong interaction between Fe/P-O-Co bonds and the uniform dispersion of Co on the FePO₄ surface. These factors contribute to a reduced bandgap energy, improved light absorption, and more efficient charge separation, collectively resulting in significantly better catalytic activity. Subsequently, the effects of radical scavengers show that the photogenerated electrons were the primary species responsible for the reduction mechanistic pathway. This study showed that cobalt loaded on FePO₄ is a viable, economically feasible source for the photocatalytic remediation of hexavalent chromium.

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