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Revisesd Jiang model's «New formula of Prediction of lattice constant in cubic perovskites»

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ABX_3 Perovskite materials are of great interest in the new technology because of the possibility of modifying their physical properties by numerous ionic substitutions.

The mesh parameter prediction model used is useful for providing the predicted structural information for estimating the physical properties of materials for which accurate structural data are not available.

It is also useful as a guide for synthetic exploratory efforts as a starting point for structural characterization improvements of new materials.

Our reformulation of Jiang's model allowed us to obtain a new equation of parameter prediction of cubic perovskite structures taking into account 158 materials.

The results obtained are in good agreement with the experimental with a relative error of the order of 2.64%.

This prediction equation allowed us to predict the mail parameter of 20 new perovskite oxides.

Keywords: mail parameter prediction, cubic perovskite, tolerance factor.

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Removal of methylene blue by adsorption using modified hydroxyapatite by carrageenan biopolymer

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The application of hydroxyapatite modified by biopolymers for the immobilization of various pollutants has been considered as a promising pollution control technology. In this scope, hydroxyapatite-Lambda carrageenan CaHAp-(λ-Carr) hybrid materials were prepared by co-precipitation method with different content of the bio-polymer (0, 5, 10 and 20%). Synthesized materials were characterized using X-ray diffraction (XRD), Infrared spectroscopy (FT-IR), chemical analysis, Scanning Electron Microscopy (SEM), specific surface area (SS) and pH_{zpc} measurement. The X-ray powder analysis showed that the cristallinity is affected by the presence of the biopolymer. The FT-IR spectra show the presence of (λ-Carr) and CaHAp characteristic vibrations in the resulting product. After grafting BET measurements yielded particle specific surface areas ranging from 93 to 260 $m^2\ g^{-1}$ depending on the grafted biopolymer. The adsorption capacities of methylene blue (MB) were investigated with respect to the effect of adsorbent amount, pH value, contact time, adsorbent dose, temperature and initial dye concentration. The pseudo-second-order and Freundlich isotherm equations were found to describe the adsorption mechanism. The percentage of MB removal by CaHAp and CaHAp-(λ-Carr)10 were equal to 81.40 % and 95.63 %, respectively. The results indicate that the modified hydroxyapatite possessed good adsorption ability towards MB dye and can be used as a low cost adsorbent for dye removal from wastewater.