Title (4)	:	**Recovery of Phosphate from Artificial Human Urine using Magnesium-Modified Biochar for Immobilization of Lead in Soil [Pemulihan Fosfat Daripada Urin Manusia Tiruan Menggunakan Biochar Yang Diubah Suai Magnesium Untuk Imobilisasi Plumbum Dalam Tanah]**
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Abstract	:	Magnesium-modified biochar (MB) is used to recover phosphate (PO43-) from urine by struvite precipitation. Pyrolysis of sawdust (SD) at 700◦C and subsequent impregnation with MgO2 produced MB. Virgin and spent MB were characterized for proximate analysis, surface morphology, elemental composition, specific surface area, and functional groups using thermogravimetric analysis (TGA), scanning electron micrography (SEM), energy dispersive X-ray (EDX) analysis, surface area analysis, and Fourier transform infrared (FTIR) spectroscopy, respectively. The batch sorption experiments were conducted on MB using artificial human urine (AHU), where residual PO43- was quantified by colorimetry. Sorption data were analyzed using various isotherm (i.e., Langmuir and Freundlich) and kinetic models (i.e., pseudo-first and pseudo-second-order) for elucidation of sorptive potential and mechanism. Pyrolysis of SD produced porous sawdust biochar (SB) with a high surface area. However, modification with MgO2 decreased the surface area of MB, possibly due to the loss of micropores from oxidation and deposition of struvite as confirmed by SEM-EDX analysis. FTIR analysis showed that polar functional groups such as carboxylate (1641 cm-1), phenolate (1300 cm-1), and amide (1674 cm-1) were mainly involved in the Mg2+ and PO43- adsorption...see more