

# SYNTHESIS AND CHARACTERIZATION OF ZNO/ACTIVATED CARBON COMPOSITE FROM CINNAMON WASTE AS ABSORBERS OF Pb<sup>2+</sup>

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## ***ABSTRACT***

Research on isothermal adsorption studies on the absorption of Pb<sup>2+</sup> using ZnO/activated carbon from cinnamon waste has been carried out. The research was conducted on a laboratory scale. This study aims to synthesize activated carbon from cinnamon waste which is treated with ZnO and determine the maximum adsorption results of metal ion Pb<sup>2+</sup>. And it was characterized by using Fourier Transform Infrared (FTIR), Scanning Electron Microscopy-Energy Dispersive X-Ray (SEM-EDX) and X-Ray Diffraction (XRD) and carried out determination of pH, carbon mass, contact time and optimum concentration. The results of FTIR characterization of ZnO/KA composite analysis are characterized by the presence of functional groups C = C, CO, OH, SEM-EDX analysis produced plates and chunks and pore shapes with the amount of C elements amounting to 86.09% on activated carbon and 74.61% on composites, XRD analysis resulting diffraction angle 2θ between 2,960°; 2,863°; 2,815°; 2,736°; and 2,700° indicates the presence of ZnO compounds which give the dominant intensity at the diffraction angle of 2θ between 32.244°; 34.895°; 36.72°; 57.021°; dan 63.272°. Maximum adsorption power of Pb<sup>2+</sup> ions at pH 10, maximum concentration at 30 ppm, optimum weight of 1 gram and optimum contact time for 30 minutes. Adsorption kinetics from pseudo-second order with R<sup>2</sup> of 0.9985.

Keyword: activated carbon cinnamon waste, composite, adsorption, ZnO.

