

**ECO-FRIENDLY ABSORBENTS TO REMOVE Cd²⁺ FROM
SYNTHETICALLY MADE CADMIUM CONTAINING WASTEWATER**

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Removal of trace elements from industrial wastewater is a crucial step in the industrial wastewater treatment process. Cadmium (Cd²⁺) is a common trace element found in industrial wastewater and it causes many health issues in human and other organisms. Cadmium treatment methods used currently are highly expensive and tend to generate a larger amount of toxic sludge. Therefore, this study focused to investigate the potential of construction demolition wastes (CDWs) to remove Cd in industrial wastewater. Two types of CDWs i.e. laterite blocks (LB) and clay brick (CB) were used as eco-friendly and low-cost adsorbents in this study. Samples were crushed and sieved separately to obtain three categories of particle sizes ranges (PSR) (<0.5 mm, 0.5 – 1 mm and 1 – 2 mm) from each selected CDW type. Each sample was analysed for pH, electrical conductivity (EC), cation exchange capacity (CEC), moisture, and total Cd contents. Sorption isotherm of Cd was prepared for each PSR of two CDW types by plotting sorbed Cd²⁺ against initial Cd²⁺ concentrations viz., 0, 25, 50, 75, 100 ppm. Significant differences of EC, CEC, and total Cd content were observed among PSRs of the selected CDW type ($p < 0.05$). Moisture content was significantly different among PSRs of clay bricks ($p < 0.05$). All these properties showed decreasing trends with the increase of particle sizes in both types of CDW due to the reduction of specific surface area. In contrast, pH and moisture content values were comparable in all particle sizes of both CDW types. The polynomial models were best fitted with sorption isotherms of Cd prepared for different PSRs of clay bricks ($R^2 > 0.99$). These results revealed the high potential of clay bricks to remove Cd²⁺ from wastewater.

Keywords: Construction Demolition Wastes (CDWs), Wastewater, Sorption Isotherms