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Abstract

Immobilization of enzymes on the solid supports can improve the stability as well as catalytic properties of enzymes. In this study, biochar derived from various feedstocks were used as immobilization support considering biochars carbon negative as well as sustainable properties. Partially purified (concentrated) crude laccase was covalently immobilized onto pine wood (BC-PW), pig manure (BC-PM) and almond shell (BC-AS) micro-biochars using optimized 5% w/v glutaraldehyde. Moreover, citric acid pretreatment improved the laccase binding capacity of all the micro-biochars and the highest laccase binding of 40.2±1.8 U g^{-1} was observed with BC-PM in comparison with raw BC-PM (34.1±1.1 U g^{-1}). The enhanced binding of laccase on BC-PM over wood derived biochars was attributed to the higher surface area (46.1 m^2 g^{-1}) of BC-PM.