# ABSTRACT

The present study deals with production and extraction of laccase enzyme employing submerged fermentation techniques. For this purpose, *Aspergillus niger* was used to produce laccase enzyme under submerged fermentation techniques. For the production of laccase various fermentation parameters such as carbon sources, nitrogen sources various conc. of sucrose, yeast extract, $KH_2PO_4$, $CaCl_2$, $FeSO_4$, $ZnSO_4$, $CuSO_4$, were optimization. It was observed that the maximum laccase production was obtained when 5g of sucrose, 5g of yeast extract,5g of $KH_2PO_4$, 5g of $CaCl_2$, 5g of $FeSO_4$,5g of $ZnSO_4$,5g of $CuSO_4$, was added to the medium. After optimization all the factors using OFAT technique one-liter fermentation was also run. After determination of laccase a highest laccase production (0.415±0.015 u/ml) was observed in it. The purification and characterization of laccase was also done. The laccase enzyme was also tested for its version biotechnological as such as industrial application of laccase enzyme Phenol oxidation of petrol refinery waste water. Significant results were obtained after application of laccase enzyme.