

ABSTRACT:

This study investigated the effects of different additives and precursors on the catalytic activity of laccase entrapped in sol-gel silica. It was found that the laccase catalytic activity and stability of sol-gel laccase could be enhanced if the entrapment was performed in the presence of additives such as PVA, PEG and APTS. The use of TEOS as a precursor showed slightly higher laccase catalytic activity compared to TMOS. The PVA as an additive showed a better catalytic activity enhancement compared to the PEG and APTMS with the optimum PVA concentration of 0.03 mg/mL. The optimal temperatures of sol-gel laccase without and with additives were found to be at 40 and 27°C, respectively. After 70 days of storage at 27°C, the catalytic activity of the immobilized sol-gel laccase with additives maintained its catalytic activity compared to only 30% of its original catalytic activity for the sol-gel laccase without additives.