

KINETICS OF β -GALACTOSIDASE IMMOBILIZED ON POLYSILOXANE-POLYVINYL ALCOHOL MAGNETIC COMPOSITE – POS-PVA_M

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β -Galactosidase is an enzyme with a wide industrial application, mostly in the hydrolysis of lactose and, more recently, in the synthesis of oligosaccharides. Several advantages are associated with the application of immobilized enzymes. In this work, β -Galactosidase was covalently immobilized onto a POS-PVA_M using glutaraldehyde as activating agent and its hydrolytic properties evaluated. For both soluble and immobilized β -Galactosidase, the optimal temperature and pH were found to be 50 °C and 6.5, respectively. The immobilized enzyme showed to be more resistant than the soluble form when hydrolysis experiments were performed out within the above optimal condition, being the observed difference in activity more pronounced for temperatures higher than 50°C. An enhancement of the thermal stability of the immobilized enzyme was also observed. The apparent K_m and E_a for both soluble ($7.377 \pm 1.303\text{mM}$ and $25.51 \pm 8.72\text{Kj mol}^{-1}$) and immobilized enzyme ($7.841 \pm 1.189\text{mM}$ and $32.61 \pm 5.82\text{Kj mol}^{-1}$) showed to be not significantly different. The immobilization also proved to be advantageous as, after twenty reutilizations, the immobilized enzyme retained about 52% of its initial activity. These results clearly demonstrate that POS-PVA_M may be used for β -Galactosidase immobilization since, besides improving the enzyme hydrolytic properties, its separation from the obtained reaction products is easier to accomplish.