XANTHINE OXIDASE IMMOBILIZADED ON MAGNETIC POLYSILOXANE-POLYVINYL ALCOHOL COMPOSITE

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Xanthine oxidase (xanthine:oxygen oxidoreductase, XOD, E.C. 1.17.3.2) is a relevant molybdenum enzyme in clinical analysis with a well-established structure and mode of action. It has already been immobilized on several matrices such as polyacrylamide gel beads, polyamide-11, Dacron, polyaniline-silicone, modified carbon paste electrode, nanocrystal gold-carbon paste electrode and controlled-pore glass. In this study, a magnetized hybrid inorganic-organic composite, based on polysiloxane and polyvinyl alcohol (POS-PVA) network, activated with glutaraldehyde, is proposed as a matrix for the immobilization of bovine milk XOD. The enzyme was partially purified with ammonium sulfate fractioning at 38-50% saturation, yielding a preparation with a specific activity of 69 mU/mg of protein. The immobilized XOD on magnetic POS-PVA-glutaraldehyde presented an optima pH and temperature at 8.8 and 60°C, respectively. Michaelis constant for the XOD immobilized was 8.86 ± 0.88 µM for xanthine. The preparation showed that there was no decrease of activity after five reuses and only 17% after ten. When 6-mercaptopurine was used as substrate, immobilized XOD was still able to recognize it and convert to 6-thiouric acid. Based on these results one can propose this magnetic POS-PVA-glutaraldehyde as support for the XOD immobilization.

Supported by: CNPq
Key words: immobilization, magnetic, polyvinyl alcohol, xanthine oxidase