MAGNETIC POLYSILOXANE-POLYVINYL ALCOHOL COMPOSITE AS MATRIX FOR XANTHINE OXIDASE IMMOBILIZATION

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Xanthine oxidase (xanthine:oxygen oxidoreductase, XOD, E.C. 1.17.3.2) has already been immobilized on several matrices and its enzymatic property evaluated. Particles of hybrid composite of polysiloxane and polyvinyl alcohol were synthesized by sol-gel process, magnetized by co-precipitating Fe^{2+} and F^{3+} ions in ammonia solution. The covalent immobilization of bovine milk XOD, via glutaraldehyde, on these magnetic POS-PVA particles yielded preparations containing 9.5 ± 0.5 µg of protein per mg of support and specific activity of 36.3 ± 7.8 mU/mg of protein, corresponding to 55.0 ± 11.7% of free enzyme. The optima pH (8.8) and temperature (60^{o}C) were slightly higher than those established for free enzyme (8.2 and 55^{o}C, respectively). The apparent Michaelis constant calculated for the immobilized and free XOD were 8.86 ± 0.88 µM and 7.48 ± 1.01 µM, respectively (no statistic difference). The preparation showed that there was no decrease of activity after five reuses and only 17% after ten. The 6-mercaptopurine oxidation catalyzed by the immobilized XOD on magnetic POS-PVA followed the same pathway described for the free enzyme and no 6-thioxanthine was formed. Additionally, this preparation presents the following advantages: simple synthesis, low cost, reusable and can be easily removed from the reaction medium by a magnetic field.
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