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Effect of acetonitrile on the binding of competitive inhibitor proflavin and on the catalytic activity of bovine pancreatic α -chymotrypsin

Sirotkin V., Mukhametzyanov T.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

The binding of competitive inhibitor proflavin by the α -chymotrypsin enzyme in water-acetonitrile mixtures over the entire range of thermodynamic water activities was studied. The data on the binding of proflavin were compared to the results on the catalytic activity of the enzyme preliminary incubated in water-acetonitrile mixtures. Based on an analysis of the shape of the concentration dependences, it was demonstrated that the leading factor in controlling the behavior of the enzyme at low water activities is interprotein contacts formed during its drying. At high water activities, the functional properties of the enzyme are largely determined by the interaction with the organic solvent. The interplay of these two factors manifests itself through a complex shape of the isotherm of binding of proflavin, with the maximum being positioned in the range of moderate water activities. © Pleiades Publishing, Inc., 2006.

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