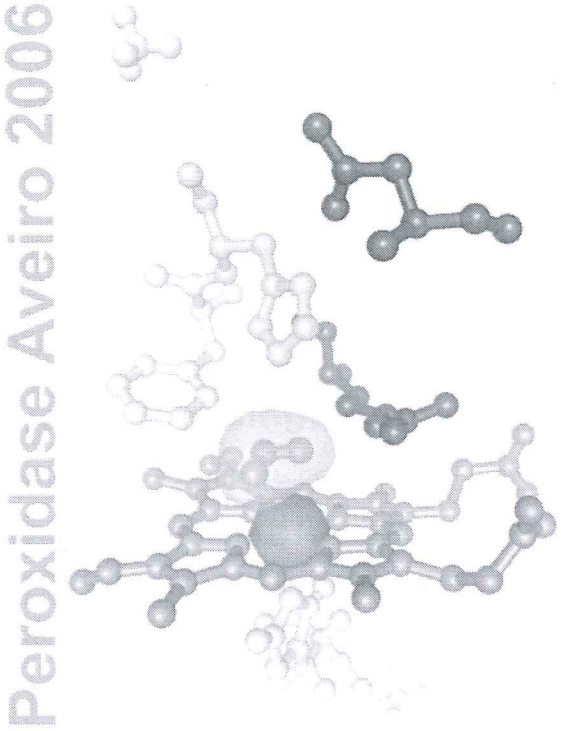
Peroxidase 2006
Aveiro, Portugal 6-9th July



Programme and Abstracts

S5-O3

Thermal Inactivation and Activity Regain of Horseradish Peroxidase in Aqueous Mixtures of Imidazolium-Based Ionic Liquids

M. F. Machado & J. A. Saraiva

U. de Aveiro, Dep. de Química, 3810-193, Aveiro, Portugal, E-mail: jsaraiva@dq.ua.pt

Peroxidases (EC 1.11.1.7) are ubiquitous enzymes of industrial interest for their application in clinical chemistry, environmental biosensor, bioconversion of industrial effluents and synthesis of polymeric materials and aromatic chemicals. Such applications are often carried out in systems containing organic solvents [1].

In recent years, room temperature ionic liquids (low melting point salts) have attracted increasing attention as alternative "green" solvent media for biocatalysis, mainly because of their high chemical and thermal stability, lack of vapour pressure, tunable polarity, along with easier product isolation and catalyst reuse. Horseradish peroxidase (HRP) has been shown already to be active in ionic liquids/aqueous buffer mixtures [2].

It is therefore important to characterize HRP activity and thermal deactivation behaviour in "wet" ionic liquids. The present study examines the effect of mixtures of phosphate buffer with the water-miscible ionic liquids, [BMIM][BF_4] and [BMIM][Cl], on the isothermal deactivation kinetics of horseradish peroxidase. Spontaneous HRP activity regain following thermal deactivation was also quantified and discussed from the viewpoints of a relationship between deactivation profiles and kinetics and enzyme reactivation yields.

Author M. F. Machado acknowledges Fundação para a Ciência e a Tecnologia, Portugal, (grant SFRH/BPD/11458/2002).

[1] A. M. Klibanov (1997). *Trends Biotechnol.* 15, 97-101.
[2] G. Hinckley, V. V. Mozhaev, C. Budde and Y. L. Khmelnitsky (2002). *Biotechnol. Lett.* 24, 2083-2087.