

# **Lipase Deactivation in the Presence of Ozone: Effect on the Interfacial Properties of the Enzyme.**

Jurado, E., Luzón-González, G., García-Román, M., Jiménez-Pérez, J.L.

Chemical Engineering Department, Faculty of Sciences, University of Granada.

Granada, Spain

The applications of ozone in cleaning and disinfecting industrial equipments and installations are widely recognized [1]. Ozone reduces the amount of surfactants and other components needed to achieve an adequate washing performance and also permits to reduce washing temperature [2]. Additionally, in order to develop more environmentally friendly detergent formulations, enzymes (mainly proteases, amylases and lipases) are also being used in detergents for laundry and hard surfaces [3]. However, the interaction between ozone and enzymes has not received much attention so far [4]. In this work we have investigated the effect of ozone on the activity and interfacial properties of a commercial lipase for detergents (Lipex® from Novozymes). To do that the enzymatic activity at 30°C and neutral pH have been measured before and after the addition of different amounts of ozone. The interfacial properties of the enzyme have also been determined by comparing the reduction on the interfacial tension between water and i-octane caused by the native and the “ozonized” lipase. According to our results, the enzymatic deactivation caused by ozone is almost instantaneous, but the amount of ozone consumed by one enzyme molecule is greater than that needed to deactivate it. In addition the ozonized enzyme exhibits a faster adsorption dynamic than the native one. These facts suggest that smaller peptide chains are release by the action of ozone which causes the enzyme to lose its secondary or tertiary structure and become deactivated. Because of that more ozonereactive groups become exposed to the action of ozone molecules.

## **References.**

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