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## **REMOVAL OF AROMATIC COMPOUNDS FROM WASTEWATER BY HEMOGLOBIN SOLUBLE AND IMMOBILIZED ON EUPERGIT<sup>®</sup> CM**

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### **Abstract**

The potential application of methemoglobin from bovine blood to remove aromatic compounds in the presence of hydrogen peroxide has been evaluated. The organic compounds herein tested include phenols, amines or hydrocarbons, which are pollutants deriving from different industries and display high persistence and toxicity in waters. The oxidative process has been characterized by soluble hemoglobin and immobilized on Eupergit<sup>®</sup> CM, using 4-chlorophenol as a model substrate. The obtained data revealed the good effectiveness of the biocatalytic process within the pH 6-8 range, with an optimum pH of 7.5 for the free protein and of 7.0 for the immobilized one. Oxygen evolution in the system was also measured continuously, and indicated that this system significantly contributes to reduce oxygen demand in wastewaters. It was possible to reuse the same hemoglobin-polymer beads as biocatalysts three times. Therefore, the use of hemoglobin in industrial wastewaters treatment may be a good alternative because, despite being somewhat less active, it is able to catalyze the oxidation of different aromatic pollutants, is relatively cheap, and is a food industry waste, which makes the process more ecofriendly.

*Key words:* aromatic compounds, Eupergit<sup>®</sup> CM, hemoglobin, peroxidase-like activity, wastewater

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