"Active Surfaces": Biomelecule - Polymer Membranes for Efficient Sensing of Phenols

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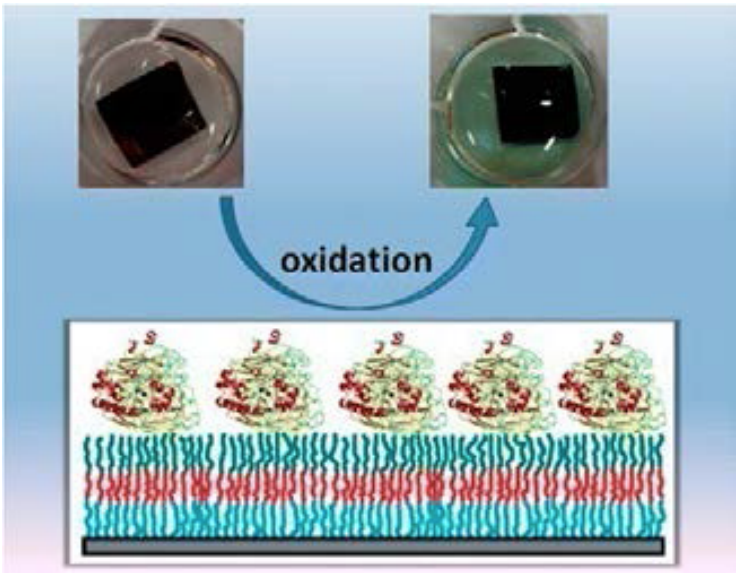

Figure 1: Oxidation of a phenolic compound by the active surface

The design of surfaces that present active compounds at the interface with their environment is on focus today in various domains, such as catalysis, medicine or environmental sciences. An elegant approach is to combine biomolecules (enzymes, proteins, mimics) with synthetic membranes in order to generate a stable and functional hybrid system.1

Here we present how two different enzymes are combined with asymmetric membranes and serve for development of "active surfaces" for sensitive detection of specific compounds. Solid supported membranes of PEG45-b-PMCLx-b-PDMAEMAy copolymers were prepared by LB-LS methods in different combinations of conditions. Laccase and Tyrosinase, as model enzymes for detection of phenol compounds were immobilized on soft surfaces resulting from polymer films deposition. Interestingly, the enzymes activity and stability varied depending on the film properties, which support further optimization of such active surfaces.

[1] C. Draghici, J. Kowal, A. Darjan, W. Meier, C. G. Palivan, Langmuir, 2014, 30, 11660.