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Using Atmospheric Pressure Plasma Technology For One Step Enzyme Immobilization ARNE VAN HOECK, SABINE PAULUSSEN, VITO — The immobilization of biomolecules is of great interest for a variety of applications like for e.g. biosensors, biocatalysis, lab on chips. While some methodologies are readily applicable in industrial processes, a simple and fast single step immobilization protocol would offer a cost effective alternative for straightforward production. Plasma coating technology has been recognized as an attractive technology for surface treatment of materials since it is considered as inexpensive, easy to operate and allow to reduce solvent use substantially. The most remarkable feature of non-equilibrium atmospheric pressure plasmas is the low temperature which leads to a high preservation of polymer functional groups and a minimum damage to native biomolecule structures. This work aims at the development of a new, direct immobilization strategy for biomolecules. By feeding the DBD atmospheric plasma discharge zone simultaneously with an polymer precursor and an enzyme (glucose oxidase) solution, it is possible to fabricate a bio-functional layer where the enzymes become entrapped into the polymer matrix. It will be shown that a single step technology has been developed that enables fast immobilization of biomolecules while retaining their bioactivity. The immobilized biomolecules are homogeneously distributed within the polymer coating.

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