

Microstructured surface treatment by atmospheric-pressure microplasmas

Initiative: Herstellung funktionaler Oberflächen (beendet)

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The project focusses on a new class of area-selective surface modification processes, based on atmospheric pressure microplasmas, which will integrate surface treatment and lateral microstructuring within one process step. The microplasmas to be investigated will be generated in cavities which are formed temporarily by the substrate to be treated area-selectively and a suitably formed arrangement of an electrode and a polymer dielectric generated by new microtechnical techniques. For a range of cavity dimensions (50-500 μm), electrical conductivities of the polymer substrates, and for two excitation frequencies, microplasmas will be investigated experimentally and theoretically with respect to their temporal and spatial characteristics. Two types of surface functionalisation will be studied in detail, including the evaluation of new methods for their spatially resolved analysis based on fluorescence methods. As an example of use, the suitability of an array of reactive spots on a polymer substrate for the combinatorial synthesis of selected biochemical probes used in bioassays will be evaluated.

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