

Chemical Approaches based on a Complex Surface Modification leading to antimicrobial/antibiofilm as well as degradative capabilities

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ABSTRACT: The presentation is based on several approaches based on the surface modification of multiple materials. Some of them are used to modify their surface and thus antimicrobial / antibiofilm surfaces are obtained. These surfaces can be further valorised many applications including civil engineering (especially wastewater plants) but also in the preservation and protection of the cultural heritage. The chemical approach is especially important because long-lasting effect is requested and also, it is important to avoid the leakage of these antimicrobial agents into the nature produce secondary pollution. The last approach is used to modify the mesoporous materials by the means of photocatalysts inside and outside of the pores. By short, the mechanism of action involves, the pollutants, especially antibiotics absorption followed by the degradation to more eco-friendly substances, which will not generate and nor enhance the antibiotic resistance. This approach can be extended to a wide range of wastewater treatment by minimal changes in the actual treatment plant. Comparing to the classical applied absorption technology where the sorption / desorption equilibrium is leading to a long-term release of the antibiotics, at low level, and thus generating resistance, this approach leads to the degradation of these pollutants and thus a lower risk of developing antibiotic resistance.

Keywords: chemical surface modification, antibiofilm activity, photo-degradative approach

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