

Brief information about the project

Name of the project	AP19679298 «Development of visible-driven heterostructured TiO ₂ –based photocatalysts for air treatment»
Relevance	In this project we first propose to synthesize doped TiO ₂ nanoparticles and TiO ₂ -based heterostructures using the so-called Metal-Organic Frameworks (MOF)-templated synthesis approach (Ti-based MOFs used as sacrificial substrates).
Purpose	Develop scientific principles for efficient, scalable, and economic approaches to doped TiO ₂ nanoparticles and/or TiO ₂ based heterostructures that do not only absorb visible light ($\lambda > 400$ nm) but also have suitable bandgap ($E_g < 3.3$ eV) to drive photocatalytic reactions.
Objectives	<p>1) Syntheses of MOFs using titanium, manganese and/or iron compounds as precursors. Synthesis of TiO₂ –based nanoparticles and heterostructures by thermolysis of synthesized MOFs.</p> <p>2) Evaluation of the photocatalytic properties of titanium-containing catalysts.</p>
Expected and achieved results	<p>1. New and facile methods will be developed allowing the preparation of doped-TiO₂ or/and TiO₂-based heterostructures using a bimetallic MOF-templated synthesis approach.</p> <p>2. The fundamental features in the mechanism of the photocatalytic activity of prepared nanoparticles will be determined.</p> <p>3. Scientific principles will be created for the development of new preparation methods (by the thermal decomposition of MOFs) of TiO₂-based photocatalyst to further expand their applications in the environment remediation as paints/coating/plaster materials for air outdoor and indoor treatment.</p>
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List of publications with links to them	-
Patents	-



