

CHEMICAL ENGINEERING

PNRR/MICS/CRT - Development of catalysts at low temperatures for air pollution control

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Context of the research activity	<p>Study and development of innovative catalysts and photocatalysts for the abatement of air pollutants (VOCs, CO, Cl-VOCs, PM, NOx, bacteria) in confined environments at room conditions.</p> <p>Progetto finanziato nell'ambito del PNRR, M4C2, Investimento 1.3 - Avviso n. 341 del 15/03/2022 - PE0000004 Made in Italy circolare e sostenibile (MICS) – CUP E13C22001900001 - Spoke 4.</p>
Objectives	<p>The removal of pollutants for indoor air purification is a key point to ensure the health and well-being of people in enclosed and confined environments. In this context, catalytic oxidation at low temperature (mainly at room temperature) represents a challenging route that can be exploited. This is an important research objective since mastering activity, selectivity and realizing a single pot process to remove not only gaseous pollutants but also bacteria that commonly can be found in indoor contexts is a formidable technological challenge from the application perspective.</p> <p>This research activity aims to address in a unifying vision and approach the concept of catalytic oxidation of VOCs, CO and other pollutants with the inactivation of microbial species using sustainable materials based on heterogeneous catalysis. A particular focus will be given to photocatalysis, which can bring several advantages, such as sustainability and technological easiness, feasibility to the large scale, high performance at room temperature, etc. The activity also aims at the design and production of a prototype of a full-scale device with antimicrobial and catalytic properties.</p>
Skills and	<p>The required competences will be:</p> <ul style="list-style-type: none">- synthesis of catalytic and photocatalytic materials (metal oxides, zeolites,

**Skills and
competencies
for the
development of
the activity**

porous materials, nanoparticles) through complementary techniques

- structural, microstructural and surface characterisation of catalytic and photocatalytic materials
- management of experiments on lab-scale plants as well as single equipment and process modelling
- fluid dynamics simulation and modelling