

PRESENTER INFORMATION



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BIOGRAPHICAL SKETCH

Prof. Dr. Nataša Novak Tušar has been the head of the Laboratory for catalysts and research program Chemistry of catalysts for clean air in the Department of Inorganic Chemistry and Technology at the National Institute of Chemistry in Ljubljana since 2022. After receiving her PhD in chemistry from the University of Ljubljana, she was an individual Marie Curie fellow at the ELETTRA synchrotron and the University of Trieste, Italy, from 2003-2004. Her research interests include catalyst/photocatalyst design and development in heterogeneous catalysis for environmental and energy applications. Since 2018, she is a full professor and director of the PhD programme "Materials" at the University of Nova Gorica, Slovenia. She is a member of the governing bodies of ENMIX (European Nanoporous Materials Institute of Excellence) and EFCATS (European Federation of Catalysis Societies). She is a member of the editorial boards of the journals Catalysis communications and Frontiers in chemistry

TITLE Titania-silica porous photocatalysts in pollution remediation

ABSTRACT

A look at the literature on photocatalysis reveals that in the last 10 years there has been steady flux of more than 1300 international patents per year for various applications, mostly in the fields of pollution remediation, green chemical synthesis and solar energy conversion. Pollution remediation, including water purification and air cleaning, is the most important one.

The lecture is based on the case study of porous silica supported titanium dioxide as a coating for photocatalytic removal of volatile organic pollutants from the air or/and organic pollutants from water. Titanium dioxide (TiO_2) is the most used material for mentioned applications due to its interesting characteristics: low cost, high stability, shows high photocatalytic activity, it can promote ambient temperature oxidation of the major class of organic pollutants. However, due to the hindered applications of TiO_2 as non-supported systems for photocatalytic air and water cleaning, design and development of TiO_2 supported systems are very important. Common support materials are porous silica materials. These materials exhibit high specific surface areas, high porosities in a variety of pore sizes, and high thermal and mechanical stability, while they are mostly chemically inert. Here, an overview on the design and development of coatings from a) porous SiO_2 supported TiO_2 for removal of volatile organic pollutants from indoor-air under UV light and b) porous SiO_2 supported TiO_2 functionalized with transition metals for removal of organic pollutants from water under visible light will be given.

