



UNIVERSITÀ
DEGLI STUDI
DI PADOVA



Giovedì 3 ottobre alle ore 15:00 presso l'Aula E
Dipartimento di Scienze Chimiche, via Francesco Marzolo 1

Prof. Simone Mascotto

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terrà il seminario:

“Designing surfaces of multimetal oxides for catalysis: quality or quantity?”

The development of cost-effective, efficient of pollution abatement technologies covers a key role in nowadays society. An optimal catalyst for these applications should be highly active, stable and comprised of earth-abundant materials. In these regards, perovskite oxide family with general formula ABO_3 is a favorable class of materials, thanks to their structural flexibility and ease in accommodating non-stoichiometry.

In this talk, the development of synthesis strategies that encompass variation of chemical composition, morphology and defect structure of surfaces of perovskite oxide is presented.

Chemically complex mesoporous perovskite oxides were prepared by La- and Fe- co-substitution in the $SrTiO_3$ lattice to form $La_{0.3}Sr_{0.7}Ti_{1-x}Fe_xO_{3\pm\delta}$ solid solutions with a composition variation between $0 \leq x \leq 0.5$. The choice of cationic substituents was based on the compromise between stability and catalytic performance. Porosity and nanostructure tuning of $SrTiO_3$ -based systems were realized through a straightforward inorganic endotemplating route integrated into a polymer complex synthesis. Finally, the consolidation of $SrTiO_3$ -based nanoparticles by electric field-assisted treatments determined significant modification of the point defect structure of the material surfaces along with their conductivity mechanism, thus resulting in high surface reactivity and improve catalytic performance.

This multistep material development perspective aims to present the preparation of oxide architecture with tunable functional properties as a forward-looking strategy towards catalysts with higher performance.

**Il Direttore del Dipartimento
Prof. Michele Maggini**

Prof. Silvia Gross