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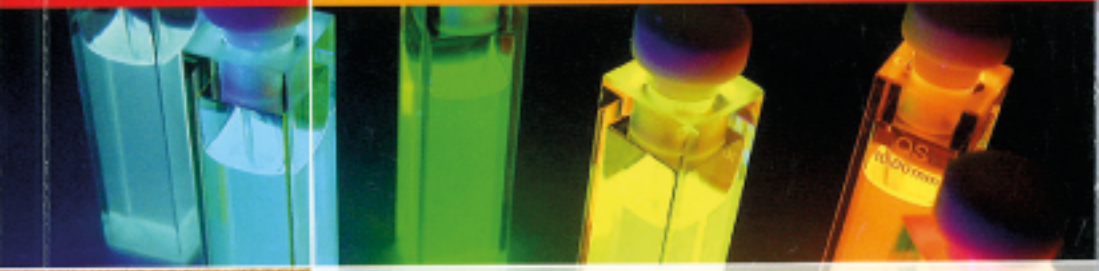

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BOOK OF ABSTRACTS

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ToF-SIMS investigations of oxygen tracer diffusion in Fe-doped $SrTiO_3$ and Sr-doped $LaFeO_3$ thin layers

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Fe-doped $SrTiO_3$ and Sr-doped $LaFeO_3$ are mixed ionic and electronic conducting perovskite oxides. $SrTiO_3$ serve as a model material for large band gap mixed conductors with well understood bulk defect chemistry while properties of thin layers are still under strong investigation [1]. The second material, $LaFeO_3$, is a promising electrode material for solid oxide fuel cells (SOFC) in both oxidizing and reducing atmosphere [2], [3].

Accordingly, the transport and reactions kinetics of both materials are of high interest. For this purpose thermally driven $^{18}O_2$ isotope exchange experiments and subsequent Time-of-Flight Secondary Ion Mass Spectrometry (ToF-SIMS) analysis were performed. The diffusion profiles provide information on the tracer diffusion coefficient D^* and the surface exchange coefficient k^*.

In the case of Fe-doped $SrTiO_3$ interfacial space charge layers, which are characterized by depletion of the oxygen vacancies concentration and a spatially varying tracer diffusion coefficient, could be identified. For Sr-doped $LaFeO_3$, a novel approach allowed comparison of k^* and D^* values under reducing and oxidizing conditions. This shows that the surface exchange reaction under oxidizing and reducing conditions is similarly fast but the diffusion coefficients differ drastically.

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