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INM-KOLLOQUIUM

"INSIGHTS IN THE STRUCTURE AND PROPERTIES OF HYDROTHERMALLY GROWN $NB_3O_7(OH)$ PHOTOCATALYSTS AND THEIR TI CONTAINING DERIVATIVES"

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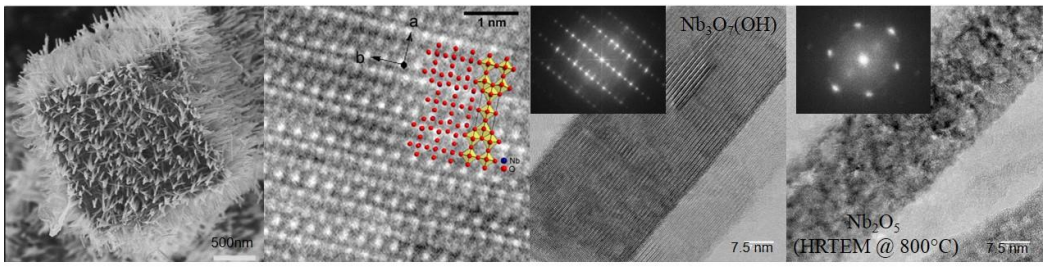
INM, Leibniz-Saal, Campus D2 5
Gastgeber: Prof. Dr. Volker Presser

Within the last years several concepts were developed for creating environmentally friendly energy sources, such as photovoltaics, fuel cells, and photo-electrochemical cells, which are based on novel nanostructured morphologies. For these energy conversion systems semiconducting oxide nanostructures are of great interest since they can be used as e.g. electrode materials or photocatalysts. One promising candidate is the n-type semiconductor $Nb_3O_7(OH)$, which can be fabricated as 3D nanoarray using a hydrothermal synthesis approach [1]. The 3D nanoarray consists of nanowires arranged perpendicular to each other. The occurring defects within the $Nb_3O_7(OH)$ nanostructure are the key parameters which determine the functionality as will be discussed in the talk. The nanostructures have been studied in depth using advanced transmission electron microscopy including electron energy loss spectroscopy and electron tomography. The functional properties of the $Nb_3O_7(OH)$ arrays can be improved by the incorporation of Ti within the orthorhombic crystal structure which leads to a higher hydrogen production rate in light driven water splitting experiments [2]. The defects play also an important role during the thermally induced phase transformation to Nb_2O_5 as discovered by in-situ transmission electron microscopy (TEM) experiments [3].



Scanning electron microscopy image of a novel 3D nanoarray (left) [1]; high resolution TEM image showing the atomic structure (middle) [1]; and in-situ high resolution TEM images (right) acquired at room temperature and at 800°C revealing the thermally induced phase transformation [3].

Wir laden 15 Minuten vor Beginn zu einem Get-together mit der Referentin ein.

KONTAKT

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