Bavarian research & innovation

FOROXID – Bavarian Research Cooperation for Multi Scale Design of Functional Oxidic Materials (FOROXID)

HIGHLY ACTIVE AND PROMISING

Due to their versatile specific properties functional oxidic materials establish unique possibilities for a broad application within the electrical industry, light engineering, sensor technology, lens coating, thin film technology or magneto-optics.

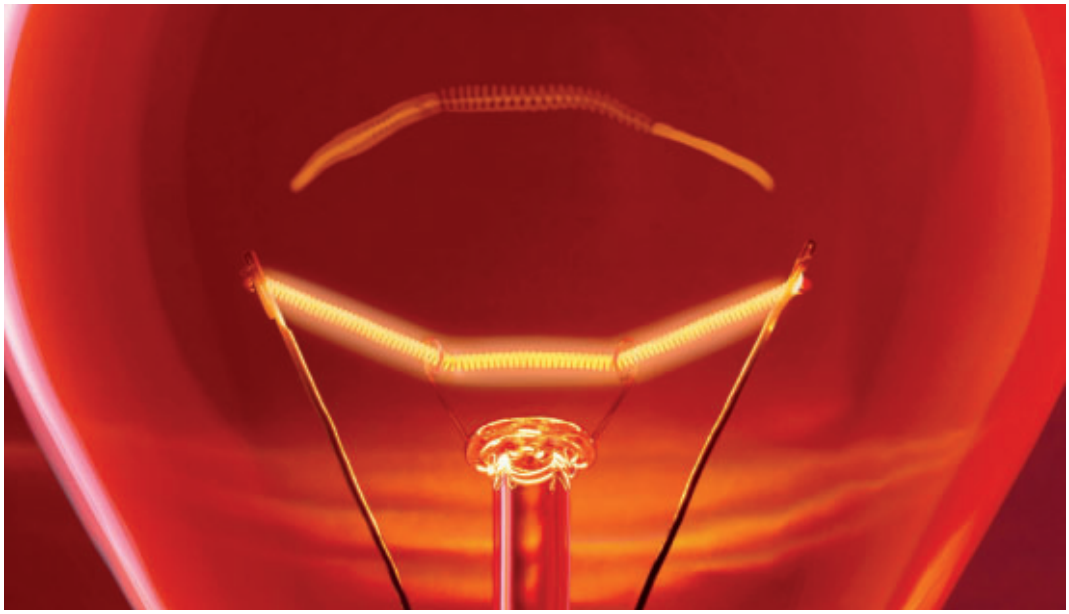

Photo: OSRAM GmbH, Munich

From structure to function

In order to go on with investigation and usage of oxdic compounds as functional materials one has to have a detailed knowledge about the correlation of structure and electronic properties of the oxides. Thus FOROXID concentrates its research projects on the formation and buildup of oxidic compounds as well as on the properties determined by the structure. Properties of functional materials are controlled by fabrication and conditioning, so that a degradation due to aging is reduced or in the ideal case prevented. Thereby structural defects are of particular importance. They can arise systematic or casual during production or due to aging of the material when used. Certain defects are desired or even essential to reach specific properties of a material: Without embedded defects there won´t be ionic conductors or numerous sensor materials which are based on a specific insertion of impurities.

Innovation due to research

Nowadays oxidic functional materials are widespread used in different applications. Nevertheless their full potential has not been made available. Additionally aging due to thermal load or aggressive atmosphere in many industrial cases points out to be problematic. Research cooperation of the industry with universities and research establishments assists the industry to ensure its position within a global economic market and hence to maintain jobs or even to add new jobs.

Spokespersons:
Prof. Dr. Bernd Stritzker, University of Augsburg
Thorsten Stein (Rupp + Hubrach Optik GmbH, Bamberg)

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RESEARCH TOPICS:

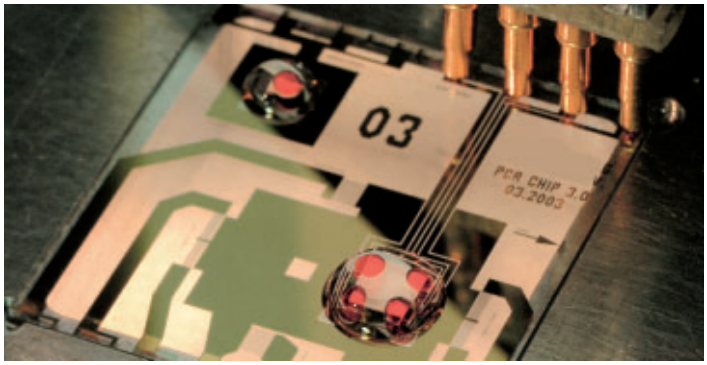

Photo: Advalytix AG

Photo: Prof. Dr. Jochen Mannhart, Univerity of Augsburg

Projects:

TP 1:	ZTA-Ceramics	Fraunhofer ISC, CeramTec AG
TP 2:	HC-Sensors	University of Bayreuth, Siemens AG
TP 3:	Coated conductors	University of Augsburg, Nexans Deutschland AG
TP 4:	Nano particles	Fraunhofer ISC, R + H Optik GmbH (R+H)
TP 5:	Thin film system for biochips	University of Augsburg, Advalytix AG
TP 6:	Magneto-optical sensors	University of Augsburg, AxynTeC Dünnschichttechnik GmbH, Carl Zeiss AG
TP 7:	Interface reactions	University of Augsburg, University of Würzburg, OSRAM GmbH

Economic Applications:

Expansion of the application of electronic circuits to unfavorable conditions (heat and vibration).
Improvement of flue gas cleaning of diesel engines.

Loss-free conductors for conurbations with high energy demand.

Scratch-resistant coatings for sensitive optical lenses.

Biochips for a fast and cheap medical analysis.

A Microscope, which can visualize magnetic fields.

Fluorescent tubes – more durable, environmental adjusted and energy saving.

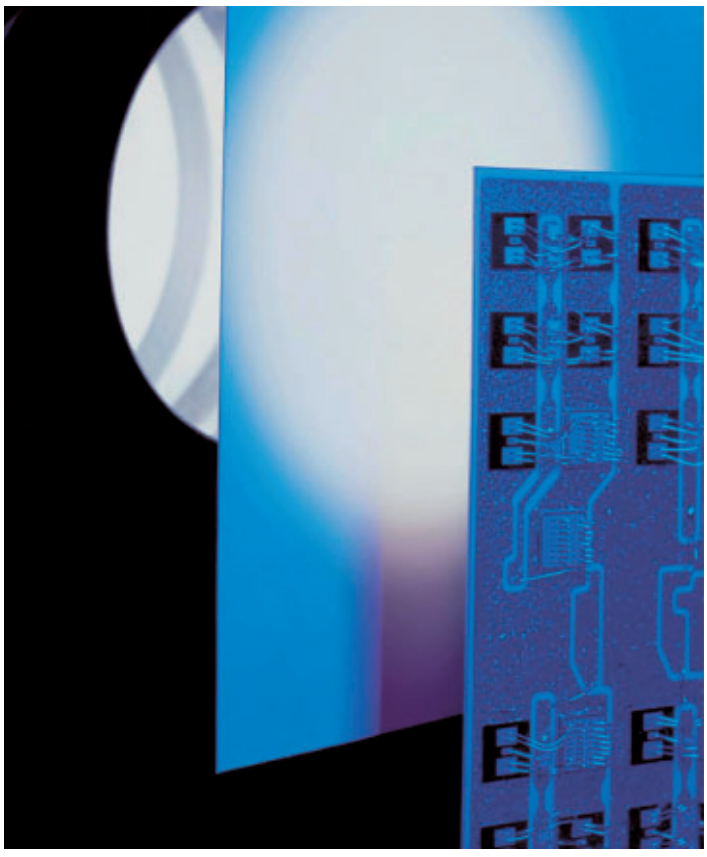

Photo: Fraunhofer ISC, Würzburg

Cooperation:

- University of Augsburg:
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  Institute for Physics
  Prof. Dr. Siegfried Horn,
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- University of Bayreuth:
  Prof. Dr.-Ing. Ralf Moos,
  Chair for Functional Materials
- University of Würzburg:
  Prof. Dr. R. Claessen,
  Institute for Physics
- Fraunhofer-Institut für Silicatforschung ISC, Würzburg:
  Dr. Friedrich Raether,
  Dr. Gerhard Schottner

Industrial Partners:

Advalytix AG, Brunnthal;
AxynTeC Dünnschichttechnik GmbH, Augsburg;
CeramTec AG, Marktredwitz;
Nexans Deutschland AG, Nuremberg;
OSRAM GmbH, Augsburg;
Rupp + Hubrach Optik GmbH (R+H), Bamberg;
Siemens AG, Munich
and Carl Zeiss AG, Göttingen.