

Foreword: Nonstoichiometric Compounds

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On April 3–8, 2005, the International Conference “Nonstoichiometric Compounds” was held in Kauai, HI, USA in the Sheraton Kauai Resort Hotel. The conference was sponsored by Engineering Conferences International (ECI). The aim of this conference was to bring together scientists from diverse disciplines, who are working on nonstoichiometric compounds (e.g. oxides, nitrides, oxynitrides, chalcogenides). Traditionally, the effects of stoichiometry deviations were investigated by those looking to understand and control the electrical, diffusional, and in many cases, the mechanical properties of oxides, with the aim of using such materials as solid oxide fuel cell electrodes, as sensors, as permeation membranes, and in various other electrochemical reactors. Complex oxides that exhibit nonstoichiometric effects are now also employed in high T_c superconducting devices and as transparent conducting electrodes in displays and photovoltaics. These and other oxides are being developed for all-oxide electronics, high speed photonics and magnetoresistive devices. Furthermore, driven by the semiconductor industry, interest has also expanded to include nitrides, chalcogenides, oxynitrides, oxychalcogenides, etc.

This special section of the Journal of Materials Science contains 14 papers selected specially from the total of 49 oral presentations and 26 posters given at the meeting. The main themes of the meeting were:

- Transport
- Bulk Properties
- Transparent Conducting Oxides
- Surfaces, Interfaces
- Theory
- Fuel Cells
- Intermetallics

The first conferences on nonstoichiometric compounds were held at the beginning of the 1980's. Then, after a break of more than 10 years, there were UEF-sponsored conferences that focused on “Nonstoichiometric Ceramics and Intermetallics” in 1998 and 2001. This conference returned to the old name “Nonstoichiometric Compounds” and brought together 70 scientists from 10 countries (from Asia, Europe and the USA).

In view of the success of the conference it is intended to hold the next one in Japan in 2008. Further details may be obtained at <http://www.engconfintl.org/> or from me at the address below.

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