Ceramics in Bologna

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The 7th International Symposium on Ceramics (7th SIMCER) was held from December 14–17, 1988 in Bologna, Italy. The meeting was organized by the Centro Ceramico in Bologna as part of the 900th anniversary celebrations of Bologna University, and about 730 participants from nearly 30 countries throughout the world attended. Two sessions were organized to run in parallel, one for advanced ceramics, and the other for more traditional ceramics. Approximately 100 papers and posters were presented in the advanced ceramics sessions and about 50 in the traditional ceramics sessions.

The advanced ceramics meeting consisted of six sessions: 1) Superconductivity, 2) Composites, 3) Ceramics on Duty, 4) Processing of High Tech Ceramics, 5) Electronic Ceramics and 6) Structural Ceramics, each being opened by one or two plenary lectures and lasting for half a day.

In the first lecture, *D. R. Clarke* (U.S.A.) presented "Ceramic Superconductors; Relationships between Processing, Microstructure and Properties", emphasizing state-of-the-art research in oxide superconductors and future tasks. The lecture was followed by several contributed papers and a general discussion on the future prospects for these materials. Compared to their bright future in micro-electronics, their application in power transmission systems was thought to be much more difficult.

The afternoon session began with two lectures: "Principles of Design with Ceramic Matrix Composites" (*A. G. Evans*, U.S.A.) and "Whisker Reinforced Ceramics; Toughening Behavior and Properties" (*P. Becker*, U.S.A.). The first described the design principles of composite materials based on fracture mechanics and experimental observations at interfaces and the second gave an overview of recent experimental results.

On the second day, in the session entitled "Ceramics on Duty", microstructure development and the dependence of mechanical properties upon the sintering and environmental conditions were discussed for various materials, ranging from structural ceramics, such as SiC and Si_3N_4, to electronic ceramics, such as $SrTiO_3$. In the afternoon session, "Processing of High Tech Ceramics", *G. Onoda* (U.S.A.) discussed "Basic Phenomena in Ceramic Forming Processes", pointing out the volume expansion of powder mixtures caused by shearing and the problems this brings in powder processing.

On the morning of the 16th, in the "Electronic Ceramics" session *R. E. Newnham* (U.S.A.) lectured on "Electro-Ceramics; the Age of Integration and Miniaturization", and emphasized an important trend in electroceramics research, that of integration and miniaturization of sensors and actuators, after which about ten papers on various materials were presented. The lecture on "Structural Ceramics" given by *F. Thümmler* (FRG), summerizing the range of ceramic materials and components used as structural parts and presenting future trends in the field, was followed in the afternoon by eight other papers.

The last day was separated in the program and devoted to a special meeting "Zirconia 88". *D. Broussand* (France) gave a talk on the "Effect of Powder Characteristics on Forming and Microstructure Development of ZrO_2-Y_2O_3 Ceramics", presenting test results on four kinds of commercial powders. Among the subsequent contributed papers, the paper on "Numerical Methods for the Calculation of Stress Intensity Factors" (*W. Müller*, FRG) provided a relaxed and pleasant time for the audience by demonstrating the toughening effect of ZrO_2 particles by using a movie film, which in fact could be used effectively for demonstration purposes in university courses.

In addition to invited lectures and the presentation of papers, poster presentations were also made in the afternoons of the 14th and 16th, and, although approximately one third of the posters were missing, those that were presented were informative and of high quality.

The success of this small conference, which can boast the participation of numerous representative people, may well be due to the good opportunity given for the discussion of the problems and advances in high-tech ceramics lead by leading scientists in the relevant fields. Despite the small number of papers presented the conference covered an almost unlimited number of topics in advanced ceramics. The materials dealt with were also so multivarious that many of them were mentioned only once or twice during the whole meeting. This was advantageous for the people who wanted to get a general view of the current topics and latest results, but disadvantageous to those who were more interested in specific areas. On the whole, it was an informative and agreeable meeting and the organizers should be congratulated.

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