

FOREWORD

Since its inception in 1986, the International Symposium on High-Temperature Corrosion and Protection of Materials has attracted an increasing level of interest, and is now recognized as one of the premier events in its field. It has grown to be a much-anticipated gathering of experts from not only France and the US, which was the original intent, but from all over the world, and the symposium proceedings serve as valuable reference books for scientists involved in the use and development of materials at high temperatures and in aggressive environments.

The 7th symposium in this series again was held on Les Embiez Island, and was organized jointly by the University Henri Poincaré Nancy 1, INP-Grenoble, INP-Toulouse, and the Oak Ridge National Laboratory. In the planning of this Symposium, emphasis was placed on encouraging a mix of papers that address fundamental as well as practical aspects of high-temperature corrosion and protection, and on poster presentations intended to engender discussion. By devoting attention to understanding the corrosion problems encountered by contemporary industry, and providing opportunities for extended interactions that could lead to approaches for improving the performance of materials and protective measures, the symposium was intended to serve a complementary function to that of the science-oriented Gordon Research Conference on High-Temperature Corrosion. This year, the topics of the individual technical sessions were:

Session A—*Materials And Coatings For Gas Turbines*, in particular: lifetime issues; modes of failure; oxidation and hot corrosion; and trends and developments.

Session B—*Power Boilers And Incinerators; H₂, Syngas And Biofuels Production*, in particular: advanced steam conditions; fireside corrosion; oxy-firing; use of alternative fuels; gasification; high-temperature electrolysis; and thermochemical processes.

Session C—*High-Temperature Materials For Nuclear Processes*, in particular: pressurized-water reactors; European pressurized reactor; high-temperature reactors; very high-temperature reactors; supercritical water-cooled processes; molten metals/molten salts; and fusion reactors.

Session D—*High-Temperature Corrosion In The Process Industries*, with emphasis on the steel industry; electrometallurgy; glass and ceramics production; refining; and the petrochemical and chemical industries.

Session E—*High-Temperature Corrosion Of Functional Materials And Coatings*, in particular: materials for automotive applications; burners; filters; and fuel cells.

Session F—*Fundamentals*, in particular: high-temperature corrosion/oxidation mechanisms; influence of water vapor; mechanism of coupling between oxidation and mechanical aspects; and development of new techniques for measurement and characterization of corrosion.

This year, 131 papers were presented, continuing the trend of a gradual increase in numbers from 110 papers in 2000, and 139 papers in 2004. Fully 32% of the papers were concerned with aspects of development, testing, and determination of mechanisms of degradation of coatings. Continued efforts to understand the mechanisms of formation, growth, and failure of protective scales (including approaches for modeling) was another major area of continuing interest, and accounted for approximately 23% of the papers. A further 20% of the papers was concerned with materials issues connected to current trends in power generation, specifically addressing oxidation in steam/water vapor, the effects of firing biomass, and the use of oxy-fuel conditions, as well as materials issues associated with processes being considered in nuclear power generation. Overall, the proportion of the papers considered to address practical problems to those concerned more with

fundamental aspects was in the approximate ratio of 2:1, which is a good reflection on the intent of the original plan.

The frequency at which this Symposium is held appears to be a key feature, since a three-to-four year time span is sufficient for the generation and analysis of new data to form the basis for fresh, rather than refreshed papers, as well as for some topics to diminish in interest and for new ones to gather momentum. This year, there were 194 registrants from 25 countries and, of these, 45% were from France, and 10% from the USA. The corresponding numbers for the 6th and 5th Symposia were 183 and 149 participants, respectively, and 41%-8%, and 37%-10% from France-USA, respectively, which indicates not only that the Symposium continues to be very popular, but also provides an excellent venue for interaction with researchers from France, even though this opportunity is not being especially grasped by research groups from the USA.

A useful feature has been the feedback provided by means of the traditional Symposium questionnaire, which has been a source of valued advice and has led to improvements in various aspects of the way in which the Symposium is organized and run. Results from this year's questionnaire (26% return) that were of particular interest included a strong request for the inclusion of invited plenary talks specifically intended to relate to each of the main sessions, rather than being chosen from among the papers submitted in response to the general call. Further requests were to structure the overall program so that the oral papers are scheduled before the start of the corresponding poster session, and to keep all posters up all week to allow them to be revisited. Because of the popularity of the poster sessions and the physical limitation of space for posters, such modifications will require more extensive detailed planning of the program, but should be possible. One of the changes from the last Symposium, that the after-dinner sessions consist solely of poster presentations, was especially well received, and throughout the week there were lively discussions in those sessions. Overall, the continuing interest in poster presentations was considered to be a sign of the success of the Symposium format.

A final observation is that this Symposium was held at a time of transition in the way in which major industries regard their role in the generation, use and dissemination of the science and technology of materials. The current trend appears to be away from a company structure that emphasizes depth of specialized knowledge to one in which the most attractive career paths involve an understanding and appreciation of all parts of the company's business. The younger generation of technical graduates increasingly is faced with a clear message that the surest pathway to prominence in a company structure involves a holistic understanding of a company's interests, so that less value is placed on gaining specialist knowledge. Nevertheless, this trend does not appear to signal any diminishing of the appreciation by such companies for the need for continued research efforts, but rather that different approaches are being employed. However, this change in emphasis appears to be reflected in the dwindling of contributions from (and even attendance by) personnel employed in the very industries for which this Symposium originally was designed to support. Another result of such a trend is that, although some degree of materials research must continue to be undertaken in-house by industry, the burden of generating the understanding required to underpin advances in the technology falls more heavily on universities and research institutions. While this is not necessarily a bad thing, the absence of scientists with keen industrial insight from the scientific debate implicit in this Symposium, for instance, will increasingly hamper progress.

Acknowledgments

We would like to express our gratitude to our sponsors for making this seventh Symposium possible. The output from the previous Symposia set a very high standard, and we hope that the technical quality of the presentations and of the papers published in these proceedings lives up to that standard, and is in accordance with the expectation of our sponsors. We thank EPRI and ORNL

for their long-term support and encouragement, Office of Naval Research Global, UHP Nancy1, INPG, INPT, CNRS, SAINT GOBAIN, SNECMA and VEOLIA.

The success of the Symposium stems from the dedication of a relatively limited number of hard-working people: we would like to mention especially Stephane Mathieu, Fabienne Rocher, Christian Causse, Eric Mischler, Nicolas Rogier and the other members of the HTCPM 2008 Secretariat at the Université Henri Poincaré Nancy1, who ensured a seamless transition of the organization of the Symposium; Alain Galerie, Daniel Monceau and the committees who planned the program; the International Advisory Committee and all reviewers, for their efforts to ensure that the papers published conform to the high scientific standards set by earlier proceedings.

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Symposium Co-Chairmen
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