

# FIRE Compendium Series

## Volume 2A:

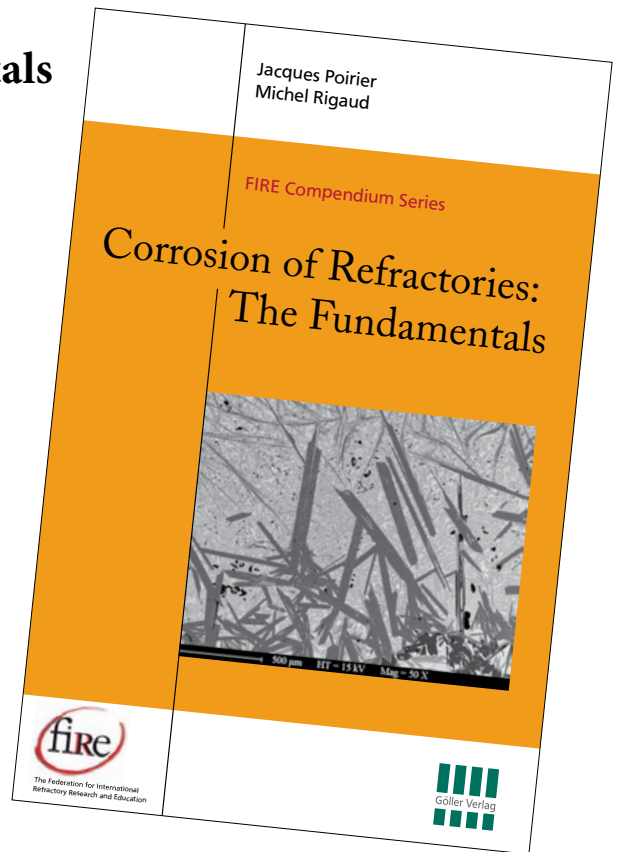
### Corrosion of Refractories: The Fundamentals

Jacques Poirier and Michel Rigaud, **Editors**

This first book on the theme of corrosion is to be followed by two other volumes: **2B** on **Testing and Characterization Methods**, **2C** on **The Impact of Corrosion** on plants availability and products quality, illustrated by pertinent case studies.

The three books are dedicated to a wide readership of refractory manufacturers and users of refractories from the industrial sectors of iron and steels, non-ferrous metals, aluminium, cement and lime, glass, chemical and petrochemical, power generation and waste incineration. The books are intending to serve not only as reference books but also to serve for educational purposes, hence should be of interest to academia, students and research engineers in this field of expertise

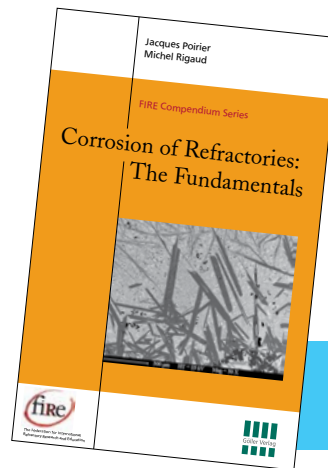
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## FIRE – Federation for International Refractory Research and Education

The Federation for International Refractory Research and Education, **FIRE** is a non-profit organisation established to promote refractory related research and education on a global basis. **FIRE** aims to stimulate and reinforce international education and research programmes for the refractory industry. Its strength is a unique grouping of expertise with 27 members drawn from all sectors of the refractory producing, supplying and consuming industries coupled with the world's leading academic institutions involved in refractory research. **FIRE** is committed to a series of research programmes, which are by definition pre-

competitive and are aimed at leveraging the research network capability of **FIRE** with contributions from both industrial and academic partners. They are designed to further refractory science and provide a basis for education through academic research. In order to further promote refractory research and education, **FIRE** is launching a compendium series in association and in partnership with Göller-Verlag publishing to make refractory science and technology available to academia, students, refractory raw material suppliers, producers, users and others interested in the refractory industry.



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### FIRE Compendium Series

#### Volume 2A: Corrosion of Refractories – The Fundamentals

Jacques Poirier and Michel Rigaud

Wear by corrosion of refractory materials remain a major concern for plant operators, manufacturers of refractories, installers and refractory engineers involved in R&D and Education in this field of expertise. The entire subject will be covered in within three volumes. The other will present an in-depth compilation of the major testing tests and characterization methods (volume 2B) and the impact of corrosion on plants availability and products quality, revealing what can be learned from post-mortem analysis, through pertinent case studies (volume 2C).

The first volume (volume 2A) on the Fundamentals is being treated at the macro-, meso- and microscopic scale, focusing on degradation mechanisms including thermal aspects; chemical aspects and transfer of materials; phase changes and mechanical aspects; and coupling between all those aspects. It does provide the readers with the conceptual tools for a clear understanding of the degradation phenomena frequent-

ly observed, providing the insights for improving the performances of those materials (inserted in complex linings) and exposed to increasingly harsh environment.

Seven authors have been recruited by FIRE, lead by J. Poirier and M. Rigaud, to cover the seven chapters: 1- Features of refractory corrosion by J. Poirier and m. Rigaud; 2- Thermodynamics by M. Rigaud, J. Smith, In-Ho Jung and J. Poirier; 3- Kinetics by Y-B Kang; 4- Wettability by N. Eustathopoulos; 5- Reactions and mechanisms of corrosion by J. Poirier; 6- Thermal, chemical and mechanical couplings by É. Blond; 7- Impact of operating conditions on refractory lining wear by J. Poirier and M. Rigaud.

The content of the book has been reviewed by fourteen fellow experts (industrials and academics) worldwide. It represents a major contribution to grasp in depth the main principles to address the major issues concerning the corrosion of refractories.