FIRE Compendium Series Vol. 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 tree 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 he 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 frequently 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.

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