Fundamentals of Slag Chemistry

Overview

The course will provide an overview of the underlying science of slag chemistry and explain howthese scientific principles relate to important industrial problems in iron, steel and copper production.The course is designed to explain to the students how the chemical behavior and properties of molten oxides can be related to chemical bonding and structure of molten slags. These concepts will then be linked to the thermodynamics of the system and methods for making useful calculations relating to important industrial problems will be shown. Case studies from iron-making, steelmaking and copper production will be used to illustrate these principles.

The syllabus of the course will contain overview and description of metallurgical slags, structure and chemical bonding of molten oxides, concept of basicity, properties of molten oxides, thermodynamics of oxide systems, Ellingham and phase diagrams in addition to the application of thermodynamic modeling for various ferrous/non-ferrous extraction processes. Few case study based problems like behavior of Phosphorus in steelmaking process, slag formation in copper smelting and design of Iron-making Slags would also be demonstrated.

Course participants will learn these topics through lectures and hands-on experiments. Also case studies and assignments will be shared to stimulate research motivation of participants.

Dates for the Course	**25th September, 2016 to 01st October, 2016**
Host Institute	**IIT Madras**
No. of Credits	**1**
Maximum No. of Participants	**40**
You Should Attend If…	▪ Shop floor engineers, managers, and R&D professionals working in the area of iron and steel production as well as non-ferrous extraction/production. ▪ Student orfaculty fromacademic institution working in the area of process metallurgy/iron and steelmaking/metal extraction. ▪ Scientists and Engineers working in applied industrial based research organizations involved in the area of metal extraction and refining.
Course Registration Fees	The participation fees for taking the course is as follows: **Student Participants:** Rs.1000 **Faculty Participants:** Rs.3000 **Government Research Organization Participants**: Rs.4000 **Industry Participants:** Rs.5000 The above fee is towards participation in the course, the course material, computer use for tutorials and assignments, and laboratory equipment usage charges. **Mode of payment: Demand draft in favour of "Registrar, IIT Madras" payable at Chennai**
Accommodation	The participants may be provided with hostel accommodation, depending on the availability, on payment basis. Request for hostel accommodation may be submitted through the link: http://hosteldine.iitm.ac.in/iitmhostel

Course Faculty

Professor Geoff Brooks is Pro-vice Chancellor (Future Manufacturing) at Swinburn University of Technology. He is responsible for co-ordinating and developing manufacturing related research and education across Swinburne University of Technology. His own expertise is in the field of process metallurgy and he has published over 150 papers on various aspects of steelmaking, aluminium and magnesium production. Geoff has held senior positions at University of Wollongong, McMaster University in Canada, CSIRO and is now Head of the High Temperature Processing group at Swinburne University of Technology. He received his PhD at the University of Melbourne in 1994; he has a Degree in Chemical Engineering at RMIT and a Bachelor of Arts (HPS, Media) from Swinburne. In 2013, Geoff was awarded the John Elliott Lectureship by the AIST, acknowledging his contribution to process metallurgy. He is a Fellow of the Institute of Engineers. He has also won major international awards from the ASM, TMS, ISS and MetSoc.

Dr. Ajay Kumar Shukla, is Assistant Professor in the Department of Metallurgical and Materials Engineering, IIT Madras. He received his B.Tech and Ph.D. from IIT Kanpur. His research interests include process modeling, control and optimization of iron and steelmaking as well as non-ferrous extraction.He has spent almost one decade in steel industry at various managerial and technical capabilities (nine years in SAIL-Durgapur Steel Plant and almost one year at National Metallurgical Laboratory, Jamshedpur).He is currently involved with number of applied industrial research based projects with various steel plants.

Course Coordinator

Name: Dr. Ajay Kumar Shukla
Phone: +9122574762
E-mail: shukla@iitm.ac.in

.....

URL: https://mme.iitm.ac.in/shukla/