



## Industrial Hydrometallurgy - The Present and Future

Prof. Fathi Habashi

**Short Course:** 27 Nov 2011, Fiesta Americana Condesa All Inclusive Resort, Cancun, Mexico

Participants will learn about hydrometallurgical processes and equipment, about principles and chemical reactions involved, about flowsheets of different processes, etc. The course is designed to help participants in understanding the technology of aqueous processing of ores and concentrates to produce pure metals. Participants are encouraged to ask questions and discuss problems during and after the course.

### Who Should Attend

This course would be beneficial to corporation and plant managers, engineers, technologists, researchers and students involved in the development and implementation of hydrometallurgical processes.

### Course Outline

#### **Part I — Introduction**

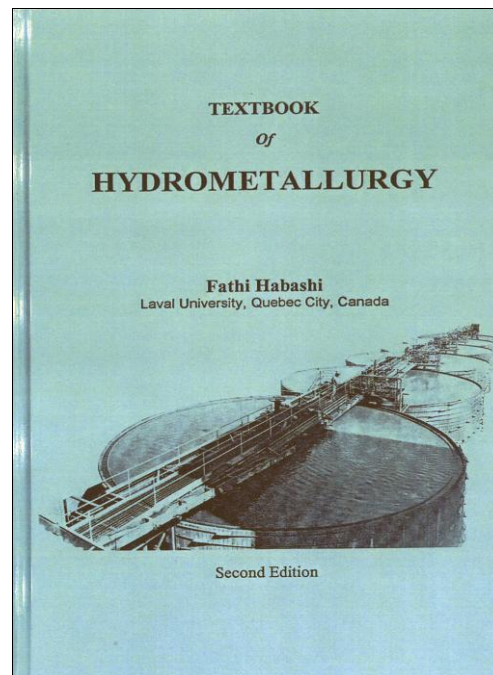
1. History
2. Scope
3. Solution Chemistry

#### **Part II — Leaching — General**

4. Leaching Agents
5. Theory
6. Methods and Equipment
7. Engineering Aspects
8. The Role of Microorganisms

#### **Part III — Leaching Processes**

9. Metals
10. Oxides and Hydroxides
11. Complex Oxides
12. Sulfides and Disulfides
13. Selenides and Tellurides
14. Arsenides
15. Phosphates
16. Silicates
17. Chlorides and Sulfates



#### **Part IV — Treatment of Leach Solutions: Concentration, Purification**





18. General Aspects
19. Adsorption on Activated Charcoal
20. Ion Exchange
21. Solvent Extraction

#### **Part V — Treatment of Leach Solutions: Precipitation**

22. General Aspects
23. Physical Precipitation: Crystallization
24. Hydrolytic and Ionic Precipitation
25. Reduction
26. Laboratory Autoclaves for Hydrometallurgical Research

#### **The participants will also receive:**

- The participants will receive a copy of the instructor's *Textbook of Hydrometallurgy*
- [750 pages, hard cover]
- Certificate of completion
- Lunch and refreshments



#### **Course Instructor Prof. Fathi Habashi**

Fathi Habashi is Professor Emeritus of Extractive Metallurgy at Laval University in Quebec City. He holds a B.Sc. degree in Chemical Engineering from the University of Cairo (1949), a Dr. techn. degree in Inorganic Chemical Technology from the University of Technology in Vienna (1959), and Dr.Sc. *h.c.* from the Saint Petersburg Mining Institute in Russia (1993). He was a postdoctoral fellow at the Department of Chemistry, University of Vienna (1959–1960), then he held the Canadian Government Scholarship in Ottawa (1960–1962), taught at Montana College of Mineral Science & Technology (1964–1967), then worked at the Extractive Metallurgical Research Department of Anaconda Company in Tucson, Arizona before joining Laval in 1970. In 1998 he was named a Fellow of the Canadian Institute of Mining,

Metallurgy, and Petroleum and in 1999 he received its silver medal. He is an Honorary Professor at the Technical University of Oruro in Bolivia, Honorary Citizen of the city of Oruro, Governor at the Fondation de l'Université Laval, and Member of Le Cercle des Ambassadeurs in Québec City.

**REGISTRATION:** <https://www.flogen.com/FraySymposium/registration.php>

