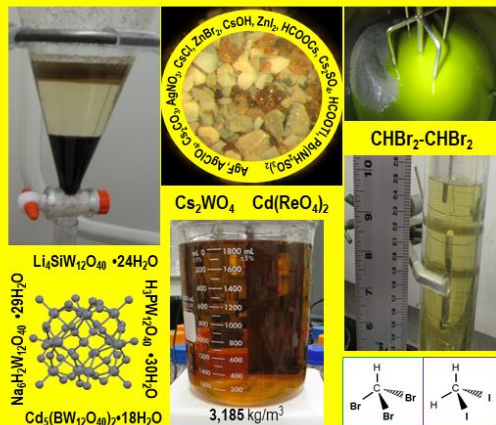




François Cardarelli

Heavy Liquids for the Separation of Minerals: Their Preparation, Properties, and Uses



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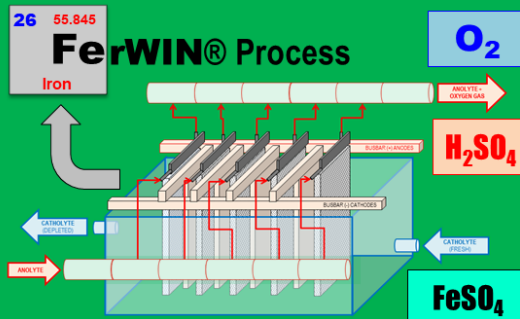
Sulfuric Acid Digestion, Sulfuric Acid Baking, and Sulfation Roasting in Mineral and Chemical Processing, and Extractive Metallurgy



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Electrowinning Iron and Recycling Sulfuric Acid from Iron Sulfates: A Zero-Carbon Iron-Making Process



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Electrowinning Iron and Recycling Sulfuric Acid from Iron Sulfates: a Zero-Carbon Iron-Making Process

Author: **François Cardarelli**

Publisher: **Electrochem Technologies & Materials Inc., Montreal**

Pages : xxviii, **471** pages, **181** tables, **140** figures B/W and Color

Format: 6 inches x 9 inches (15.24 cm x 22.86 cm)

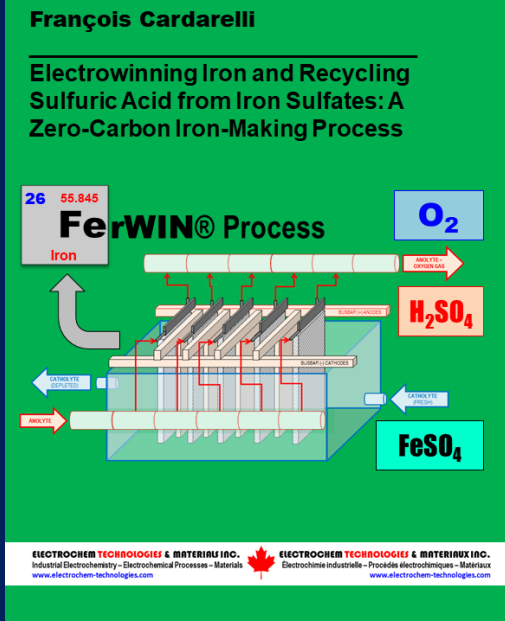
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This comprehensive monograph is primarily intended to describe the patented **FerWIN® technology**, a green and zero-carbon iron-making process, which consists to perform the electrowinning of iron metal and the recycling of sulfuric acid from iron sulfates that are by-produced at the million tons scale worldwide while releasing pure oxygen gas.



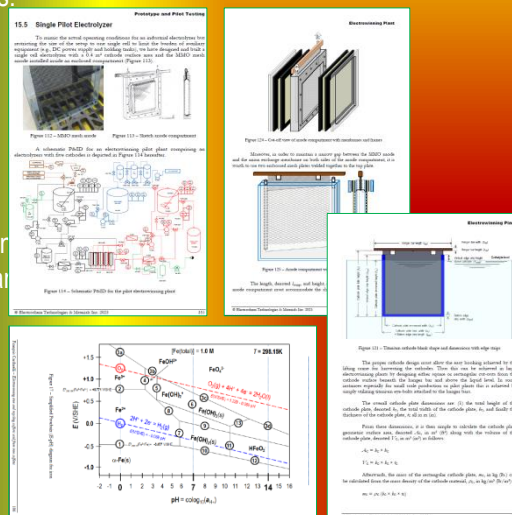
The information has been presented in such a form that industrial electrochemists, chemical engineers, metallurgists, and other practicing engineers, scientists, professors, and technologists will have access to relevant scientific and technical information supported by key experimental data that were obtained from extensive laboratory, prototype, and pilot testing. It also includes comprehensive electrochemical and engineering calculations, costs and benefits analysis, financial and sensitivity analysis.

This monograph will be of value also to men and women engaged in the traditional iron and steelmaking industries that want to understand this novel electrochemical technology outside their conventional blast furnace, direct reduced iron, and electric arc smelting processes.

Finally, the monograph may be of interest to persons in the steelmaking industries occupying managerial positions such as chief executives, chief operating officers, and V.P. of operations.

The following topics are covered:

- ☐ Background, markets, and prior art;
- ☐ Electrochemical definitions;
- ☐ Thermochemistry of electrochemical reactions;
- ☐ Transport phenomena; Electrode kinetics;
- ☐ Electrochemical figures of merit; Electrochemical calculation;
- ☐ Selection of electrolytes, industrial electrodes, and membranes;
- ☐ Electrochemical reactor design and performances;
- ☐ Industrial electrowinning plant calculations;
- ☐ Prototype and pilot testing;
- ☐ Costs and benefits analysis;
- ☐ Financial and sensitivity analysis; Implementation strategy;
- ☐ Bibliography; Appendices; Index.





Sulfuric Acid Digestion, Sulfuric Acid Baking, and Sulfation Roasting in Mineral and Chemical Processing, and Extractive Metallurgy

François Cardarelli

Sulfuric Acid Digestion, Sulfuric Acid Baking, and Sulfation Roasting in Mineral and Chemical Processing, and Extractive Metallurgy



H₂SO₄

Author: **François Cardarelli**
 Publisher: **Electrochem Technologies & Materials Inc., Montreal**
 Pages : **xvi, 285 pages, 93 tables, 76 b/w figures**
 Format: **6 inches x 9 inches (15.24 cm x 22.86 cm)**
 Publication: **December 17, 2022**

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This monograph is primarily intended to serve as a concise review of the industrial utilization of sulfuric acid and the plethora of sulfation techniques used extensively in the mineral, chemical, and metallurgical industries across the world.

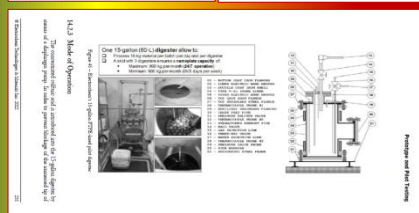
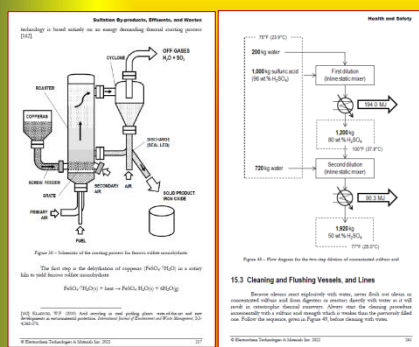
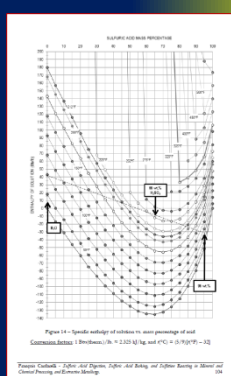
The information has been presented in such a form that industrial chemists, chemical engineers, and other practicing engineers, scientists, professors, and technologists will have access to relevant scientific and technical information supported by key data gathered from several disseminated sources along with a brief description of each major industrial processes (e.g., phosphates, titanium dioxide, lithium, alumina, and beryllium), and finally several novel sulfation technologies that might be implemented in the near future.

This monograph will be of value also to men and women engaged in other branches of chemistry and metallurgy that want to understand these techniques outside their field of expertise.

Finally, the monograph may be of interest to persons in the chemical and metal industries occupying nontechnical positions such as executives, patent attorneys, traders, purchasing agents, salesmen and women, to whom a general knowledge of the technical aspect of their business would be helpful

The following topics are covered:

- ☐ Physical and chemical properties of sulfuric acid and oleums;
- ☐ Corrosion resistant materials;
- ☐ Thermochemistry of sulfation reactions;
- ☐ Industrial sulfation processes;
- ☐ Novel sulfation processes;
- ☐ By-products, effluents, and wastes;
- ☐ Concentration and regeneration of sulfuric acid;
- ☐ Prototype and pilot testing;
- ☐ Health and safety;
- ☐ Economic data;
- ☐ Appendices;
- ☐ Index.



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