

*Chemical Fixation and Solidification of Hazardous Wastes*, by J.R. Conner, Van Nostrand Reinhold, New York, NY and Chapman and Hall, London, 1990, ISBN 0-442-20511-2, 692 pp., \$ 64.00.

The field of chemical fixation and solidification (CFS) has just begun to mature into an accepted environmental technology — and the development of their technology owes a great deal to the author of the book who was a pioneer in the field. Pushed by U.S. Environmental Protection Agency (U.S. EPA) regulations that essentially mandate its use for many waste streams, CFS is becoming a standard unit operation process for liquid and hazardous waste treatment and disposal.

CFS systems are generally quite simple conceptually and utilize standard equipment in their operation. In the CFS process, the waste to be treated is conveyed by pump, mechanical conveyor or other means into a surge tank, or feed hopper, which in turn feeds the waste into the mixer where it is mixed with the CFS reagents, a process that takes 1 to 15 minutes depending on the additive being used. After mixing is complete, the waste, still in the liquid or semisolid form, is removed from the mixer by either pumping or screw conveying. The CFS product is moved to an area where it can harden and develop its final (desired) physical and chemical properties.

When I review prospective book manuscripts for publishers, a most often asked question is: 'Is this an over- or under-published area and are there competing books?' In this case, I'd say definitely there are no books even close to this one. It's a book that has been sorely needed, and a good one at that. *Chemical Fixation and Solidification of Hazardous Waste* will be the definitive reference work in the area for years to come. It is indeed comprehensive.

The book has 18 chapters, 2 appendices, a glossary, a bibliography and an index. Let me start at the end of the book and make two points. First, the bibliography, and the citations throughout the book are excellent. There is little material that has escaped Conner's lifetime interest in the topic. Next I note the appendix, an area I commonly criticize authors for over-using. Not so in this case as Conner has provided detailed procedures for six different extraction test methods. This is the first time I have ever seen this material published in one place; I found this very beneficial.

Space precludes a detailed description of this large book. I will limit my review to a listing of the chapter titles which will give the potential reader an excellent idea of the scope of the book.

- (1) Introduction
- (2) History and background
- (3) Principles of fixation
- (4) Fixation of metals
- (5) Fixation of organic constituents
- (6) Fixation of other organic constituents

- (7) Choosing the right CFS system
- (8) Waste and waste sources
- (9) CFS process: general properties and comparative evaluation
- (10) Portland cement-based systems
- (11) Portland cement/soluble silicate process
- (12) Lime/fly ash and other lime-based processes
- (13) Portland cement/fly ash process
- (14) Kiln dust and fly ash process
- (15) Other CFS and non-chemical processes and systems
- (16) Delivery system
- (17) CFS rating and formulation
- (18) Information sources, computer applications and research development

I did perceive one or two minor problems with the publishing format (not the writer). They are:

- Some tables are continued on the next page and are very hard to follow. Some data (or headings) should be repeated for clarity.
- Some diagrams are hand drawn or reproduced (I believe) from the literature and are not equal to the professional quality of the rest of the book.

However, let not these minor criticisms reduce my strongly held feelings—this is one of the most needed and best books I have seen in some time.

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*Chemical Safety Data Sheets: Volume 2 – Main Group Metals and their Compounds*, by R. Allen (Ed.), Royal Society of Chemistry, Cambridge, U.K., 1990, ISBN 0-85186-913-0, 419 pp., £ 49.95.

In the preface, the editor expresses clearly why I, and many others are keenly interested in this type of book: "Throughout the world there is increasing concern and anxiety regarding the ever present hazards associated with the manufacture, use and disposal of chemical substances'. And that concern is magnified if data on the identification, environmental impact and health effects of chemicals involved in incidents (accidents) is not known. To this end, the Royal Society of Chemistry has set out to provide chemical data in a series of books.

The book contains data in 21 different compounds under the following headings:

- Risk and safety precaution, i.e., pyrophorics
- Safety precautions, i.e., using dry chemicals on fires
- Identifiers, i.e., synonyms, CAS No., IMCO No.
- Threshold limit value, i.e., U.S., U.K. and other European industrial hygiene limits