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CEMENT AND CONCRETE RESEARCH

Book review

***Zement—Grundlagen der Herstellung und Verwendung (Cement—Fundamentals of Manufacture and Use);* Friedrich W. Locher, Verlag Bau und Technik, Dusseldorf, Germany, 2000, 522 pp., photos, illustrations (in German)**

This book covers, in essence, the chemistry and technology of Portland cement and related composite binders, or what the author calls "Cements specified by European and German cement standards." Binders not included in these are discussed only shortly or not at all.

The book is introduced by an analysis of the existing cement standards and by a short outline of the history of inorganic cements. This is followed by a rather detailed account of the chemistry of Portland clinker and other possible cement constituents. In the succeeding discussion of cement manufacture, emphasis is put on the chemical aspects of the clinker formation process, and the environmental aspects associated with the production of cement are discussed particularly thoroughly. Subsequent paragraphs discuss the hydration of cements, the structure and properties of the hardened cement paste, as well as its durability and resistance to external factors. In the last very interesting section, the author discusses how hydrated cement and concrete may interfere with the world we are living in, either by a possible release of substances bound in its structure or by its radioactivity. It is comforting to learn that in both respects, concrete is a very safe material.

I consider the book very well written and its text excellently documented with numerous tables and figures included. It disturbs me, however, that the book also contains assertions, which are not generally accepted, without also presenting opposite views. For example, the setting of Portland cement is attributed to a recrystallization of the primary-formed ettringite, while ignoring the widely accepted role of tricalcium silicate hydration in this process. Also, not generally accepted, is the assertion, according to which the value obtained by the extraction method, rather than those obtained by DTA, thermogravimetry, or X-ray diffraction, reflects best the true free calcium hydroxide content in hydrated calcium silicate pastes. Disputed also may be the suggestion, according to which the BET specific surface area as determined by nitrogen adsorption, describes the structure of the hardened cement paste more accurately than that determined using water vapor.

An essential part of the book is the enclosed list of references that contains about 2500 items, out of which roughly one-half are papers, books, and doctoral theses published in German. In summary, it may be said that the book may serve as a valuable source of information on the subject for readers capable of reading scientific texts written in German.

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