

## Book Review

**Silicon Carbide, Part I and II, Gmelin Handbook 8th Edition.** Silicon Supplements, Volume B2, Springer-Verlag, Berlin, 1984. 314 pp. Price: DM 1080. Vol. B3, 1986. 546 pp. Price: DM 2026.

As many ceramists may not be familiar with the Gmelin Handbook (GH) series of publications a short introduction may be appropriate. The GH represents the most comprehensive encyclopedia of inorganic chemistry and allied fields. The GH celebrates this year its 170th anniversary since Leopold Gmelin published the first edition. Today, it consists of 547 volumes with more than 173 000 pages. Originally in German, it is published since 1980 in English. 128 volumes or almost 25%, including the two volumes under review, are in English.

The Gmelin Institute für Inorganische Chemie of the Max Planck Society collects all information on chemical elements and their compounds; thus the entire chemical literature is examined in the process. The Gmelin System assigns to every element or compound a definite place in the GH Series. It thus permits the retrieval of published information with great ease and the up-to-date state of knowledge on any material can readily be obtained. The text is written by various experts in the field and is based on the literature references which follow each section of text.

The two volumes on silicon carbide are of considerable interest to the ceramist working on high-technology ceramics. Much of the initial material for both volumes was prepared by the late Dr Jürgen Schlichting of the Institut für Chemische Technik of the University of Karlsruhe. After his untimely death the text for these volumes was completed by several experts

under the general editorship of Friedrich Schröder. To give an idea of the subject coverage the chapter on manufacture of silicon carbide ceramics covers 24 pages and contains 375 references. Unfortunately, the self-bonded ceramic material obtained by infiltration of a SiC—C compact with silicon, which is an impervious material containing some free silicon is classed as RBSiC (reaction-bonded silicon carbide) whilst there has been an agreement a few years ago to use the abbreviation Si—SC for this. RBSC would then be limited to the porous product obtained by the *in-situ* reaction of a Si—C mixture. Thus, there is a distinction to be made between RBSC and RBSiC.

The applications of silicon carbide are contained in 120 pages. Other chapters of major interest to the ceramist are: properties of crystalline silicon carbide, amorphous Si—C alloys, phase diagrams of systems containing Si and C in addition to other elements, the formation of silicon carbide by pyrolytic reaction including the formation of coatings by chemical vapour deposition (CVD), the formation of fibres, filaments and whiskers, purification chemical analysis, and chemical reactions of SiC with other elements and compounds.

The literature quoted the years 1950–1983. Literature previous to 1959 can be found in the volume *Silicium*, Teil B (1959). The literature quoted covers reviews, papers describing original work and patents.

The reviewer read some sections covering subjects with which he was very familiar; he found the information essentially correct, the literature quotations very comprehensive and often very concisely dealt with in the form of tables.

There can be no doubt that anybody working seriously in the field of SiC-ceramics should have easy access to these volumes. Considering their cost, unfortunately, it cannot be expected that every worker would possess a copy, although he/she would find it extremely useful.

**Paul Popper**