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# CERAMIC ABSTRACTS

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1951

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**Organizing a research department for results.** F. L. MATTHEWS. *Chem. Inds.*, 67 [3] 402-404, 452, 454 (1950).—M. discusses the objectives of a research department under product development, process development, application research, and product improvement, and its organization under groups, group leader, and service functions. E.D.M.

**Production of fused silica.** B. A. ROGERS, W. J. KROLL, AND H. P. HOLMES. *Trans. Electrochem. Soc.*, 92, 115-26 (1947).—The present manufacture of silica products is reviewed, and production methods are outlined. The reactions between hot silica and hot carbon in electric furnaces are analyzed briefly. Under experimental work, the production of silica ingots weighing up to 40 lb. (18.1 kg.) in both graphite-resistor and electric-arc furnaces is described. Data presented are sufficient for a rough estimate of the cost of production. 32 references, 3 figures. F.C.H.

**Respiratory disease—an industrial hazard.** A. T. DORG. *Glasgow Med. J.*, 30 [July] 235 (1949); abstracted in *Arch. Ind. Hyg. and Occupational Med.*, 1 [3] 360 (1950).—The present status of knowledge of the disorders caused by industrial dusts is reviewed. Silicosis is included. D.G.P.

**Role of fluorosis in industrial and alimentary hygiene.** R. TRUHAUT. *Semaine d'hôp.* (Paris), 25 [Oct. 10] 3086 (1949); abstracted in *Arch. Ind. Hyg. and Occupational Med.*, 1 [3] 367 (1950).—Fluorosis due to fluorine compounds used in the manufacture of glass, enamel, and cement is included. D.G.P.

**Safety program in a glasshouse refractories plant.** R. R. SMITH. *Glass Ind.*, 31 [5] 255-56, 272 (1950).—The safety program of the Corning Glass Works is outlined and discussed in three main divisions: educational, medical, and technical. Posters, a monthly plant magazine, and a suggestion system with monetary awards constitute the educational phase of the program. An 8-room hospital, with personnel of 8, handles the medical requirements. The technical program is based on a monthly inspection and report system designed to eliminate hazards. Plant problems fall into 6 categories: dust, heat, heavy lifting, moving machinery, acid handling, and fire. Detailed methods of dealing with each type of hazard are given. As a result of this program, the average accident frequency for the last five years has been 11 disabling accidents per million man-hours worked. The 1948 frequency for the clay-products industry as a whole was 19.53. W.W.C.

**Some ceramic ideas from Portland cement.** V. D. FRÉCHETTE. *J. Can. Ceram. Soc.*, 19, 68-72 (1950).—A high degree of development in research and control methods has been reached in the Portland cement industry. Developments indicate lines of attack in research in other branches of ceramics. Examples include the quantitative use of phase diagrams in plant control, quantitative determination of glass content by heat of solution, and phase identification by polish-etch microscopy. G.M.H.

**Technical education for the clayworker.** M. S. WHITEHOUSE. *Ceramics*, 2 [15] 138-40 (1950).—W. gives a brief outline of the institutions where technical education in ceramics can be obtained. A.B.S.

**Universities and ceramic education.** A. L. ROBERTS. *Ceramics*, 2 [15] 142-44 (1950).—In Great Britain the universities train technologists by (1) sound preliminary training in pure science and engineering and (2) systematic instruction in applying that science to specific industries. The University of Leeds may be the first in Great Britain to have a course leading to B.Sc. with honors in Ceramics. A.B.S.

#### SEPARATE PUBLICATIONS

**Elements of Patent Law.** FRED H. RHODES. Cornell University Press, Ithaca, N. Y., 1949. 190 pp. Price \$2.75. Reviewed in *Chem. Inds.*, 66 [6] 916 (1950). E.D.M.

**Employment Outlook for Engineers.** Prepared by HAROLD GOLDSTEIN, ROBERT W. CAIN, CORA E. TAYLOR, CHESTER F. SCHIMMEL, ET AL. U. S. Dept. Labor Bur. Labor Statistics Bull., No. 968, 119 pp. (1950). Price 50¢ from Supt. of Documents, Govt. Printing Office, Washington 25, D. C.

**General Treatise of the Technology of Silicates** (Obshchii kurs tekhnologii silikatov): I and II. YU. M. BUT AND M. A. MATVEEV. Published by Promstrolizdat, Moscow, U.S.S.R., 1948. 352 pp. Price 12.80 rubles.—Part I covers the composition, characteristics, methods of beneficiation, and extraction of silica (anhydrous and aqueous silicas), alumina, carbonate, sulfate, feldspar, and synthetic raw materials of silicates. Part II covers technological processes of production, composition,

properties, and application of binding materials and gives a description of the most important types of shapes made from binding materials. B.Z.K.

**Index of Nomograms.** DOUGLAS P. ADAMS. Technology Press, Massachusetts Institute of Technology, Cambridge John Wiley & Sons, Inc., New York, 1950. 174 pp. Price \$4.00. Reviewed in *Chem. Inds.*, 67 [1] 114 (1950).—Nomograms are indexed by key words and tabulated under divisions such as physics, chemistry, etc. E.D.M.

**Kent's Mechanical Engineer's Handbook: Vol. II, Design and Production.** 12th ed. COLIN CARMICHAEL, editor. John Wiley & Sons, Inc., New York 16, 1950. 1660 pp. Price \$8.50.—The book contains sections on glass, refractories, electrical porcelain, brick and tile, and abrasives. Other subjects of interest to ceramists, such as temperature-measuring instruments, are discussed. The data given on ceramic products is of a general nature and consists chiefly of physical and chemical properties applications, etc. They are of interest chiefly to mechanical design engineers and not particularly to ceramists. R.R.

**Occupational Specialties in Engineering: Vol. II, Definitions.** Prepared for the Office of Naval Research by the American Society of Mechanical Engineers for the Engineers Joint Council New York 18, 1950. 112 pp.—Definitions for ten activities and for 19 engineering fields of specialization are given. The booklet was prepared to define and delineate the terms used for fields of specialization in the Survey of Selected Engineering Personnel.

**Patent Tactics and Law.** 3rd ed. ROGER SHERMAN HOAR. Ronald Press, New York, 1950. 352 pp. Price \$7.00. Reviewed in *Chem. Inds.*, 66 [6] 916 (1950).—H. attempts to acquaint business executives, engineers, and inventors with enough of the fundamentals of patent law and procedure to enable them to understand and cooperate with their attorneys in patent matters. E.D.M.

**Review of Literature on Dusts.** J. J. FORBES, SARA J. DAVENPORT, AND GENEVIEVE G. MORGIS. U. S. Bur. Mines Bull., No. 478, 333 pp. (1950). Price 65¢ from Supt. of Documents, Govt. Printing Office, Washington 25, D. C.—The book contains a résumé of the physiological effects of breathing dust, types of injurious dusts, silicosis, methods of preventing dust diseases, methods of determining dusts in air, economic and legal aspects of dust diseases, and costs of compensation for silicosis. L.M.M.

#### PATENTS

**Assembling slabs and kiln furniture in ceramic kilns.** RENE AMAND & CIE. Fr. 952,662, May 2, 1949 (Sept. 3, 1947).—A slab assemblage of high resistance to flexural stresses between the posts is obtained by using a mortise and tenon joint between the slabs and the posts. S.F.C.

**Producing a ceramic body having longitudinal passages.** SPOLSKA PRO CHEMICKOU A HUTNI VÝROBU, NARODNI PODNIK. Brit. 631,819, Nov. 23, 1949 (June 23, 1945).—A ceramic heat exchanger is described. The body is hard porcelain or cordierite to which mineralizers or plasticizers may be added; TiO<sub>2</sub> may also be added. B.C.R.A.

#### Additional abstracts

**Sect. VIII: Slip casting. Sect. X: Measurement of the plastic working properties of clays.**

#### CORRECTION

On the title page for *Ceramic Abstracts* published in the December 1950 issue, the Committee on Publications is listed incorrectly. The present Committee is as follows: Karl Schwartzwalder, Chairman; R. E. Birch, J. J. Canfield, and C. H. Hahner.

Reprints of the corrected title page have been made, and members who bind *Ceramic Abstracts* may obtain a new title page by writing to the American Ceramic Society, 2525 North High Street, Columbus 2, Ohio.

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the surface-active organic additions is described, and flotation is especially discussed in regard to difficulties observed in practice. Starting from experience in the field of ore separation by flotation methods, the particular conditions for the flotation of carbonate and silicate minerals are described in detail, including calcite and the cement raw materials, gypsum, barite, phosphorite, and bauxite. In the chapter on the flotation of silicates, quartz-feldspar separation is emphasized, and the nature of the micas, vermiculite, and clay minerals is explained. The last group comprises the aluminum silicates, sillimanite, andalusite, and kyanite, with which extensive experience was not available in Europe before 1941, and other minerals such as spodumene, beryl, etc. Additional suggestions are given for mineral pigments (ochers, hematite, etc.). W.E.

Fluxes for automatic welding. A. PELIKAN. *Sklařské Rockledy*, 26 [2-3] 36-38 (1950).—A part of the glass factory in Antoninuv Dul was converted for the manufacture of welding fluxes to aid automatic welding processes similar to those used in making Liberty ships in the U. S. The fluxes (alkaline-earth silicates) contain 10 to 45% manganese and must be controlled to viscosities of 2 to 8 poises at 1500°C., expansions of 65 to 86 × 10<sup>-7</sup>, and softening points of 600° to 680°C. N.J.K.

Measuring relative humidity—experiments with sintered ceramic blocks. A. G. THOMSON. *Elec. Review* (London), 147 [3805] 640-41 (1950).—Sintered ceramic blocks 4 × 3 × 2 mm. are being investigated by the British Scientific Instrument Research Assoc. as hygrometers. The electrical resistance may well change from 1000 MΩ to 1 MΩ when the relative humidity changes from 10 to 95%, and the response is rapid. Development work is in progress. W.A.

Milestone in research. ANON. *Am. Ceram. Soc. Bull.*, 30 [1] 1-4 (1951). 7 photos.

Patent law revision. HARRY GOLDSMITH. *Chem. Inds.*, 67 [6] 834-85, 928 (1950).—The first general revision and codification of the patent laws since 1870, H. R. 9133, is discussed. The proposed legislation would consolidate existing legislation and provide for certain changes, such as provision for "use" patents in a limited sense, write into statutory law the doctrine of contributory infringement, set up an objective test or standard for determining invention, permit publication of pending applications, allow changes by inventors under certain conditions, provide for so-called patents of addition, and protect intervening rights where patents are reissued. E.D.M.

Progress in the technology of ceramics. FOLKE SANDFORD. *Chem.-Ing. Tech.*, 22, 165-68 (1950); abstracted in *Chem. Zentr.*, 121 II [8] 929 (1950).—The following topics are discussed: correct furnace operation; relation between color and admixture in brick masses (formation of the system Al<sub>2</sub>O<sub>3</sub>-Fe<sub>2</sub>O<sub>3</sub>); additions to improve the plasticity of lean clays and kaolins, e.g., by the mixture CaO-Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>; preparation of set gypsum by treatment with salt solutions; acceleration of the melting of glazes by additions of salts, the mineral petalite being the best; and influence of the humidity of the air on sifting (optimum 40 to 60%). M.H.A.

Report of the third International Conference of Experts on Pneumoconiosis. ANON. *Bull. Inst. Mining Met.*, 1950, No. 324, pp. 19-27. —None of the current concepts of the ways in which dust acts on the lungs is fully acceptable to the committee. In general the larger sizes of fibrous dusts such as asbestos appear to be more harmful, whereas in many other mineral dusts the smaller sizes are more injurious. There is no conclusive evidence on the effectiveness or otherwise of Al powder inhalation in silicosis. An appendix outlines suggestions for an international scheme for the classification of radiographs in some of the pneumoconioses. W.A.

Statistical consideration on the mixing of powdery materials. SHIMIZU MIYAGI. *J. Ceram. Assoc. Japan*, 58 [65] 417-20 (1950).—Mixtures of calcium carbonate and silica were analyzed, and from the analytical data the completeness of mixing is discussed. K.Y.

Stream pollution: Its prevention and control. MELVIN NORD. *Chem. Inds.*, 67 [6] 893-96, 904 (1950).—Stream pollution, stream sanitation, and the dispersion of waste effluents are discussed. The treatment of wastes is considered under the headings of mechanical separation, hydraulic separation, chemical coagulation, chemical and physical reactions, disinfection, and biological needs. What the law says. *Ibid.*, pp. 897-98. N. discusses the legal liabilities. E.D.M.

Synthesis of sapphire: a new British industry. K. W. BROWN. *Instrument Practice*, 5 [2] 88-94 (1950).—The furnace used and

the properties and uses of synthetic sapphire are briefly described. Its melting point of 2030° makes it ideal for refractory supports at high temperatures, especially as its tensile properties remain unchanged. It has also been used for furnace inspection windows, burner nozzles, atomizer orifices, and extrusion dies for work at very high temperature. 3 diagrams, 8 photos. W.A.

## SEPARATE PUBLICATIONS

- Clayworker's Handbook. 5th ed. ALFRED B. SEARLE. Chas. Griffin & Co., Ltd., London, 1949. 392 pp., 41 illustrations. Price \$6.95 from Mapleton House, Brooklyn, N. Y.—The materials, operations, and machinery for clay working in general are treated in a popular manner with many interesting and instructive examples. References to current literature are included. All operations in the use of clay, mining, preparation, mixing, forming, transportation, firing, packing, and testing, are noted. One of the most detailed chapters covers the causes and cure of about 90 defects found in finished clay products. The chapter on tests, analysis, and control gives details of instruments needed for control. The appendix contains references to 338 books published before 1928 and a list of 30 current journals. H.K.R.
- Engineering Method. JOHN CHARLES LOUNSBURY FISH. Stanford University Press, Stanford, Calif., 1950. 186 pp., 27 figures. Price \$3.00.—"The Engineering Method," organized in this special volume from material presented originally in "The Engineering Profession," formulates for students the system of logic and reasoning that is the mark of the practicing engineer. Non-technical problems are solved by way of illustration, and the steps of the method are enlarged. F. then discusses practical conditions that control the use of the engineering method and solves four problems. Inescapable uncertainties in engineering work are studied in the final section, together with ways of coping with them.
- General Survey of Work by Dr. Ryschkewitsch Largely in Field of Ceramics. Prepared by CAPTURED PERSONNEL AND MATERIAL BRANCH, MILITARY INTELLIGENCE DIV., U. S. WAR DEPARTMENT. *B.I.O.S. Misc. Rept.*, No. 107, 110 pp. H. M. Stationery Office, London. Price 9s. PB 97,646, Office of Technical Services, Washington 25, D. C., price \$2.75.—The paper is subdivided into five parts: (I) In a general survey, the extensive work in electrochemistry and ceramics done by Ryschkewitsch is outlined. Of particular interest are the fundamental studies in the field of oxide ceramics, which are described in his book (*Ceram. Abstracts*, 1949, Oct., p. 233g), and the successful evolution of a modern type of high-temperature gas- or liquid fuel-fired furnace. The production of sintered (shrunken) alumina, which was first started by Siemens (Werk Spandau) for heavy-duty spark plugs, was, under the auspices of R., developed to full industrial size by Degussa. The high importance of shrunken alumina was also practically applied to hard tools, and many contributions in this field were advanced by R. His further work on high-refractive oxides included ZrO<sub>2</sub>, BeO, MgO, etc. Methods and numerical data on the physical properties of the shrunken oxides were systematically developed. The interesting problem of the "fuel element" with the highest possible thermodynamic efficiency was one of the first objectives of these studies of high-resistance oxides. The rich field of hard alloys, especially of carbides and elementary boron, and the problem of mixed ceramics, particularly for gas-turbine blades, were extensively studied. (II) The yield strength of SiC with a ceramic binder for use as an abrasive is dealt with. The body, on a clay-feldspar-quartz basis, had the Seger formula 0.1 alkali, 0.2 Al<sub>2</sub>O<sub>3</sub>; 1.0 SiO<sub>2</sub>. The samples were pressed in steel molds, sintered, and examined by ceramic methods. The maximum strength of the mixtures was attained at sintering temperatures increasing with the addition of SiC, as a consequence of the defective molecular contact of SiC with the ceramic bond. The coated grains support the silicate body with slight temporary deformation as long as their amount is not too large. (III) This part, published in *Ber. deut. keram. Ges.*, 1942, 1944, and 1945, concerns the bending strengths of pure shrunken oxide ceramics. These data and those in the following part (IV) belong to the fundamental facts of modern oxide ceramics and deserve a particularly careful study (for details see R.'s book). (V) The chemical resistance of sintered oxides is discussed, especially of crucibles for laboratory use made of Al<sub>2</sub>O<sub>3</sub>, BeO, ZrO<sub>2</sub>, ThO<sub>2</sub>, and spinel. The results are expressed in curves of "integral corrosion," at constant temperatures with molten soda and NaOH. Under special conditions, the chemical resistance of BeO can be considerably improved. W.E.