CERAMIC ABSTRACTS

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conducting cleaned asbestos fiber away from the foraminous member, means for withdrawing an airstream and entrained dust and granular material axially from within the foraminous member at one end of the casing, a driven shaft mounted for rotation along the axis of the casing, and at least one generally radial baffle mounted on the shaft for rotation therewith, the baffle extending lengthwise of the foraminous member and being arranged to sweep close to the interior surface thereof, the shaft and baffle being adapted to be rotated by suitable power means. D.J.B.

Apparatus for tamping ceramic powders. Soc. Anon. Etablissements A. Valuy and Materiel Ceramique Moderne S. A. R. L. Brit. 732,560, June 29, 1955.—Equipment is claimed for tamping a ceramic powder in a vacuum. *Cf. Ceram. Abstr.*, 1956, Oct., p. 218*f*. B.C.R.A.

Arrangement for controlling the throughput of a fine pulverulent material through a port. René J. H. Planiol. U. S. 2,817,561, Dec. 24, 1957.—1. In combination with an apparatus for feeding a pulverulent material from a vertical container through an annular outlet at its lower end, which comprises means for feeding gas into the container above the level of the pulverulent material, means for controlling the pressure of the gas inside the container, and auxiliary nozzles arranged to blow a gaseous fluid into the container immediately adjacent the annular outlet, a rotatable and vertically adjustable conical needle valve is arranged in a port in the container to form the annular outlet. D.J.B.

Ball mills and like rotary chamber apparatus. F. Limb. Brit. 730,494, May 25, 1955.—The object is to provide a ball mill that is not subject to a critical speed of rotation. The mill rotates about its own axis and simultaneously revolves about a parallel fixed axis, the distance apart of the axes being appreciably less than the radius of the chamber. B.C.R.A.

Brickmaking machines. J. B. Hewitt. Brit. 720,569, Dec. 22, 1954.—Clay is extruded from a pug directly into cavities in metal cylinders placed against the mouthpiece; the clots of clay are then pushed out of the cavities. B.C.R.A.

Brick presses. National Coal Board. Brit. 723,665, Feb. 9, 1955.—A repress machine is described in which green brick is fed automatically into a mold for repressing. A safety device prevents unintentional entry of the ram into the mold. B.C.R.A.

Carrier devices for brick, block, etc. C. J. R. Willment and R. E. Willment. Brit. 733,582, July 13, 1955; abstracted in *Brit. Clayworker*, 65 [770] 81–82 (1956).—The device comprises a rigid frame to which are attached two pairs of gripper arms having a common actuating member. The gripper arms preferably have tongues or forklike projections on the end so that they fit under the lower surface of the brick or block as a support. B.C.R.A. & C.M.C.

Common power supply for precipitator banks with individual control. Hans Klemperer (APRA Precipitator Corp.). U. S. 2,817,412, Dec. 24, 1957. D.J.B.

Conveyers for bulk materials. Doulton & Co., Ltd. Brit. 729,799, May 11, 1955.—An air-slide conveyer is made nonwettable by treatment with a silicone. B.C.R.A.

Crushing jaws and anvils for rock-crushing machines. Louis W. Johnson. U. S. 2,816,717, Dec. 17, 1957.—4. In a double-acting rock-crushing machine having a crushing jaw operating between normally stationary anvils, a wear plate attached to each side of the crushing jaw, tensioning means carried by the crushing jaw for simultaneously applying tensile stresses to both of the wear plates in the direction of metal migration caused by the peening action of rocks being crushed, a wear plate attached to each of the anvils and opposing the wear plates of the crushing jaw, and tensioning means carried by the anvils for applying tensile stresses to their respective wear plates and maintaining the plates in tension in the direction of metal migration caused by the peening action of rocks being crushed by the jaw. D.J.B.

Electrostatic precipitator. John A. Armstrong, Philip Cooperman, and Harry J. White (Research Corp.). U. S. 2,815,824, Dec. 10, 1957.—1. In an electrostatic precipitator having a plurality of spaced parallel discharge electrodes arranged in a row and collecting plate electrodes extending in parallel spaced relation to the row of discharge electrodes, the combination with the collecting electrode plate of a plurality of baffles extending in parallel spaced relation from the plate electrode transversely of the direction of gas flow, each of the baffles comprising a base portion extending normally to the extended surface of the collecting plate and to the direction of gas flow and a leg portion sloping inwardly and upstream from the extended edge of the base portion to the collecting plate, thereby providing right triangular baffle structures projecting into the gas stream and presenting a sloping face upstream and a substantially perpendicular face downstream, the baffles on opposed plates being positioned in opposed parallel relation. D.J.B.

a **Electrostatic precipitators.** John E. McDonald and William J. Roos (Westinghouse Electric Corp.). U. S. 2,817,413, Dec. 24, 1957.—1. An electrostatic precipitator comprises a collector cell having a plurality of parallel spaced-apart collector plate surfaces, some of the surfaces being conductive, others of the surfaces having a plurality of spaced-apart conductive lines thereon from their entering portions to their air leaving portions, the others of the surfaces being dielectrics except for the lines, the air entering edges of the dielectric surfaces extending outwardly beyond the air entering edges of the conductive surfaces. D.J.B.

b **Equipment for charging fiber-containing slurry into molds.** Clyde R. Hutchcroft, Willard R. Seipt, and Robert A. Schneider (Keasbey & Mattison Co.). U. S. 2,816,321, Dec. 17, 1957.—1. Equipment for charging elongated molds with fiber-containing slurry to be molded therein comprises, in combination with a viscous flow supply line for such slurry, an elongated charge measuring device having a slurry inlet at one end in communication with the supply line and having an elongated discharge opening along the bottom of the device for sidewise delivery of a charge into a mold, means for intermittently introducing slurry from the supply line into the charge measuring device through the inlet opening, and an elongated displaceable closure member for the discharge opening. D.J.B.

c **Filter presses.** J. R. Geigy A.-G. Brit. 727,091, March 30, 1955. B.C.R.A.

d **Heat exchanger mixing mill.** John J. Fischer (Patterson-Kelley Co., Inc.). U. S. 2,816,371, Dec. 17, 1957.—1. In a material agitating and heat exchange mill, a container for the material to be processed, inlet means for charging the container with material to be processed, outlet means for discharging processed material, means mounting the container for rotation to tumible the material therewithin, a hollow shaft disposed transversely within the container and supported for independent rotation therewithin, the hollow shaft having a plurality of tubular members extending diametrically therethrough and radially therefrom at intervals longitudinally of the shaft whereby the tubular members extend into the material being processed for agitating it as the container and the hollow shaft rotate, the tubular members being opened at their opposite ends and being apertured at positions interiorly of the hollow shaft, means for introducing fluid material into one end of the hollow shaft from exteriorly of the mill, means for permitting escape of fluid materials from the other end of the shaft to a position exteriorly of the mill, and partition means disposed intermediately of the opposite ends of the hollow shaft thereby subdividing the latter into inlet and outlet end portions, whereby fluid material entering the inlet end portion of the hollow shaft finds escape through some of the tubular members into the material being processed within the container while the material is being agitated by the tubular members, and whereby fluid material within the container finds escape by passing into the outer ends of other of the tubular members to gain access to the interior of the discharge end of the hollow shaft while the tubular members are agitating the material within the container. D.J.B.

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h **Manufacture of brick and block.** H. F. Barclay. Brit. 732,831, June 29, 1955; abstracted in *Brit. Clayworker*, 64 [760] 152 (1955).—An open mold, made from hinged plates, is intended for the handmolding of small quantities of brick. B.C.R.A. & C.M.C.

i **Method and apparatus for the magnetic separation of loose material containing magnetizable parts.** Veitscher Magnesitwerke A.-G. Brit. 730,405, May 25, 1955.—The material to be treated is discharged as powder or granules at an angle toward the poles of an electromagnet. B.C.R.A.

j **Method of making ceramic forms.** Rudolph V. Ganz. U. S. 2,816,347, Dec. 17, 1957.—1. The method of manufacturing a cast ceramic dipping form in the mold cavity of a mold having air and water pervious walls comprises preforming a design member having a flexible plastic sheet facing element and a ceramic sheet backing element, the facing element being relatively smooth on one side and having an embossed design on the other side, the backing element being molded on one side against the embossed side of the facing element and having its opposite side relatively smooth and in generally parallel relation to the smooth side of the facing element, securing the design member to the inner molding surface of the mold with the smooth surface of the facing element

a pair of supporting elements on opposite sides of the kiln engaging each tire, a rigid mounting for at least one element of the pair engaging the tire adjacent the gear, a rigid mounting for at least one element of a pair engaging a tire on the opposite side of the gear from the adjacent tire, the rigidly mounted elements being substantially coaxial, resilient mountings for the elements engaging the remaining tires, means for rotating the shell including a pinion meshing with the gear at the same side of the kiln as the rigidly mounted elements, and means for introducing a combustible mixture into the kiln at one end. D.J.B.

Additional abstract:

Sect. VII: (*patent*) Refractory.

XIII—Materials

Abrasive materials. HENRY P. CHANDLER AND GERTRUDE E. TUCKER. *U. S. Bur. Mines Minerals Yearbook* (preprint), 1955, Vol. I, 20 pp., 5 figures. 15¢. Govt. Printing Office, Washington 25, D. C. Asbestos. D. O. KENNEDY AND ANNIE L. MARKS. *Ibid.*, 14 pp., 1 figure. 10¢. Barite. ALBERT E. SCHRECK AND JAMES M. FOLBY. *Ibid.*, 11 pp. 10¢. Bauxite. RICHARD C. WILMOT, ARDEN C. SULLIVAN, AND MARY E. TROUGHT. *Ibid.*, 22 pp., 2 figures. 15¢. Clays. BROOKE L. GUNSALLUS AND ELEANOR V. BLANKENBAKER. *Ibid.*, 25 pp., 3 figures. 15¢. Gypsum. LEONARD P. LARSON AND NAN C. JENSEN. *Ibid.*, 16 pp., 3 figures. 10¢. Mica. MILFORD L. SKOW AND GERTRUDE E. TUCKER. *Ibid.*, 29 pp., 2 figures. 15¢. Minor nonmetals. D. O. KENNEDY, ALBERT SCHRECK, AND ANNIE L. MARKS. *Ibid.*, 3 pp. 5¢. Pumice. L. M. OTIS AND ANNIE L. MARKS. *Ibid.*, 10 pp., 2 figures. 10¢. M.J.K.

Asbestos industry. OLIVER BOWLES. *U. S. Bur. Mines Bull.*, 1955, No. 552, 122 pp.; revision of Bull. No. 403 (1937). Govt. Printing Office, Washington 25, D. C. $1. Up-to-date information on asbestos is presented, including origin, history, utilization, production, reserves, international trade, mining, milling, marketing, beneficiation, and the manufacture of asbestos products. 15 figures. M.J.K.

Asbestos industry in 1956. ANON. *U. S. Bur. Mines Mineral Market Survey*, 1957, MMS 2658, 2 pp. Bauxite in 1956. *Ibid.*, MMS 2683, 13 pp. Clay production and uses—1956 summary. *Ibid.*, MMS 2671, 3 pp. Fire-clay production increased in 1956. *Ibid.*, MMS 2675, 2 pp. Gypsum and gypsum products—final annual figures, 1956. *Ibid.*, MMS 2692, 12 pp. Mica—block and film mica fabricated in the first half of 1957. *Ibid.*, MMS 2717, 11 pp. Mica in 1956. *Ibid.*, MMS 2689, 19 pp.; supplement. *Ibid.*, MMS 2689, 4 pp. Perlite in 1956. *Ibid.*, MMS 2700, 2 pp. Vermiculite in 1956. *Ibid.*, MMS 2704, 2 pp. Each survey free from Pubs. Distrib. Sect., U. S. Bur. Mines, Pittsburgh 13, Pa. M.J.K.

Brazilian kaolins with a tubular particle shape. HEINZ URBAN. *Tonind.-Ztg. u. Keram. Rundschau*, 32 [3/4] 41–43 (1958). —Three clays hitherto classified as kaolins but which exhibit a tubular shape of particle were examined with the electron microscope and by X-ray diffraction. In no case was the chief mineral constituent kaolinite. Two clays contained 85% halloysite, and the other, 25%. There is some evidence that the halloysite was formed from the original kaolinite mineral. 7 figures, 3 references. J.A.S.

Cellulose derivatives in the ceramic industry. J. STAWITZ. *Ber. deut. keram. Ges.*, 35 [2] 56–59 (1958). 3 figures, 1 reference. Cf. *Ceram. Abstr.*, 1957, Feb., p. 41*h*. J.A.S.

Clay minerals and permeabilities of Appalachian oil sands. E. M. TIGNOR. *U. S. Bur. Mines Rept. Invest.*, 1958, No. 5379, 30 pp. Free. Pubs. Distrib. Sect., U. S. Bur. Mines, Pittsburgh 13, Pa.—T. presents results of an investigation made to identify the clay minerals in some Appalachian petroleum-reservoir sands, the effect of clay content on the fluid-flow behavior of the sands, and the use of brines in waterflooding operations. 26 figures. M.J.K.

Comparative study of statistical analysis and other methods of computing ore reserves, utilizing analytical data from Maggie Canyon manganese deposit, Artillery Mountains region, Mohave County, Ariz. SCOTT W. HAZEN, JR. *U. S. Bur. Mines Rept. Invest.*, 1958, No. 5375, 188 pp. $1. Govt. Printing Office, Washington 25, D. C.—H. studies the use of statistical analysis to estimate the grade and tonnage of ore in a mineral deposit. He discusses methods used in sampling and computing ore reserves in the Maggie Canyon area and compares four methods used in making the grade and tonnage estimates: cross section, polygon, triangle, and statistical analysis. Surface drilling, underground drilling, and drift sampling are also compared. The simpler aspects of statistical analysis are discussed in detail. 33 figures. M.J.K.

Germanium enrichment in lignites from the Lower Lias in Dorset, England. A. HALLAM AND K. W. PAYNE. *Nature*, 181 [4614] 1008–1009 (1958). 6 references. V.R.E.

Lithium: its extraction from Western Australian spodumene ore (with notes on the ceramic and other uses of its compounds). I. J. BEAR. *Chem. Eng. Mining Rev.*, 50, 40–46 (1958).—The ceramic uses of spodumene and lithium carbonate, manganite, cobaltite, silicate, titanate, zirconate, and zirconium silicate are mentioned with a bibliography. Lithium was successfully prepared from spodumene in the laboratory by several methods. The source of the spodumene was Mt. Marion about 20 miles southwest of Kalgoorlie, Western Australia. 49 references. W.O.W.

Mineral deposits of Cuba. D. J. SIMMONS. *Mining J.* (London), 250 [6399] 409–10 (1958).—Manganese, barytes, and chromite are mentioned. V.R.E.

Mining and processing of [Virginia] kyanite. D. DIXON. *Glass*, 35 [4] 158–60 (1958). 2 figures. V.R.E.

Niobium in sea water. D. B. CARLISLE AND L. G. HUMMERSTONE. *Nature*, 181 [4614] 1002–1003 (1958). V.R.E.

Note on the aluminum oxide monohydrate. H. GINSBERG AND M. KÖSTER. *Z. anorg. u. allgem. Chem.*, 271 [1–2] 41–48 (1953).—The literature on aluminum oxide monohydrate ($Al_2O_3 \cdot H_2O$) was reviewed and checked by experiments to obtain exact knowledge on its existence and properties. The influence of time, temperature, and concentration on the transition of the hydrate was determined. The alkali concentration in the suspension has a great effect on the bulk density of the aluminum oxide monohydrate and also on the properties of the α-Al_2O_3 prepared from it. Probably this influence of small amounts of alkali is due to the incorporation of Na_2O into the lattice, mainly at places where the hydrate or oxide lattice is defective. The practical application is the preparation of materials with different bulk density (0.25 to 0.65 gm./cm.^{3} for aluminum oxide), which have different surface properties. 2 figures, 14 references. G.B.

Occurrence of beryllium oxide in polycrystalline beryllium. V. D. SCOTT AND H. WILMAN. *Nature*, 181 [4613] 902–903 (1958). 1 figure, 6 references. V.R.E.

Production of alumina by the continuous extraction of bauxite in towers. S. ZALAR. *Nova Proizvodnja*, 1952, No. 4–5, pp. 337–51; abstracted in *Brit. Aluminium Co., Ltd., Light Metals Bull.*, 20 [5] 163 (1958).—The extraction of the bauxite in the towers is a continuous process at an Na_2O to Al_2O_3 ratio of 1.45 to 1.65, a temperature of 200°C., and a pressure of 16 to 20 atm. The liquor flows through the towers (four, connected in series) at a rate of 1 to 2 m./hr. Heat requirements, 2250 cal./kg. of Al_2O_3, are much less than those in the conventional Bayer process (6000 cal./kg. of Al_2O_3). Improved desilication permits the treatment of bauxites containing more than 5% SiO_2. V.R.E.

Production of alumina from kaolin-containing clays. P. LOPEZ GOMEZ. *Ion*, 16, 410–17 (1956); abstracted in *Brit. Aluminium Co., Ltd., Light Metals Bull.*, 20 [6] 200 (1958).—The fundamental reaction is $Al_2(SO_4)_3 + 18H_2O + 3Mg(CO_2H)_2 = Al_2(CO_3)_3 + 3MgSO_4 + 21H_2O + 3CO_2$, followed by $Al_2(CO_3)_3 + 6H_2O = 3CO_2 + 3H_2O + 2[Al(OH)_3]$. The process consists of two operations carried out simultaneously: (1) production of concentrated solution of $Al_2(SO_4)_3$, from which alumina is extracted, and (2) production of a solution of $Mg(CO_2H)_2$, used as a precipitating agent. In the industrial procedure dolomite is comminuted, calcined at 500°C. in the presence of superheated steam, then bicarbonated by CO_2 in an aqueous solution; details of the chemical equilibrium of the $CaCO_3$–$MgCO_3$–CO_2–H_2O system are given. The kaolin-containing clay, in order to oxidize the iron and expel the water, is roasted and then methodically leached at 70°C. by H_2SO_4 of 62° to 60°Bé. Silica gel is separated by decantation and filtration. Through the reaction of the magnesium bicarbonate solution with the solution of aluminum sulfate, alumina in suspension is obtained which may be separated by the

studying the associations and the results of the application of these methods to various chemicals and minerals. 47 references. "Thermodynamic theory of diffusion," (in French), by S. R. de Groot.—G. discusses the derivation of a general expression for entropy for the diffusion phenomena in a mixture of charged and uncharged chemical components from the thermodynamics of irreversible processes. 11 references. "Study of fast reactions by means of mass spectrometry," (in French), by C. Ouellet.—O. discusses the identification of vapor species in flames, etc., by mass spectrometry. 33 references. "Chalcogenides of the transition elements," (in German), by H. Haraldsen.—H. reviews the recent crystal chemistry of the sulfides, etc., and oxides of the transition elements. "New developments in boron chemistry," (in German), by E. Wiberg.—W. discusses the crystal chemistry, chemical bonds, and reactions of the compounds of boron. "Protoactinium and neighboring elements," by A. G. Maddock. "High temperature chemistry—a pioneering field," by L. Brewer. —B. emphasizes the unexplored nature of the high temperature field and the lack of guide lines to predict reactions, etc., at high temperature. He illustrates his points with examples of the vaporization process and the rather unpredictable nature of the vapor species above a subliming solid. The case of phases stable at high temperature but unstable at low temperature is also discussed. The case of SiO is mentioned. 22 references. "Synthesis and properties of inorganic compounds of germanium," (in French), by H. Nowotny and A. Withmann. S. Zerfoss

PATENTS

Catalyst and method of preparation therefor. Cyril Romanovsky and Thomas E. Jordan (Publicker Industries, Inc.). U. S. 2,850,463, Sept. 2, 1958.—5. A method for manufacturing a catalyst useful for the direct catalytic conversion of ethyl alcohol to butadiene comprises forming a solution of calcium ions, nickel ions, and phosphate ions, the solution containing 7.5 to 9.2 atoms of calcium per atom of nickel, rendering the solution nonacidic and precipitating a normal metal phosphate material composed of phosphate radicals chemically combined with calcium and nickel in the relative proportion of 7.5 to 9.2 atoms of calcium per atom of nickel, and commingling a minor weight percentage of the normal metal phosphate material with a major weight percentage of magnesia and silica to form a substantially homogeneous mixture having improved catalytic conversion characteristics for catalyzing the direct conversion of ethyl alcohol to butadiene. D.J.B.

Method of and apparatus for spectrochemical analysis. Alan Walsh (Commonwealth Scientific and Industrial Research Organization). U. S. 2,847,899, Aug. 19, 1958.—1. A method of determining spectrochemically the concentration in a substance of a member of the group consisting of an element and isotopes of that element comprises the steps of converting the substance into an atomic vapor which emits radiation, passing through the atomic vapor a beam of radiation the spectrum of which contains an atomic spectral line characteristic of a member of the group, and measuring the ratio between the incident and emergent intensities of the beam, which ratio is determinative of the concentration of the member. D.J.B.

Preparation of active contact masses from kaolin clays. Joseph J. Donovan and Thomas H. Milliken, Jr. (Houdry Process Corp.). U. S. 2,848,422, Aug. 19, 1958.—2. A method for forming a hydrocarbon conversion catalyst comprises contacting a kaolin clay at about 650° to 900°F. with a gas containing about 6 to 45 mole % sulfur trioxide for a period at least sufficient to effect incorporation of about 22% SO_3 by weight in the clay and then desulfating the clay by contacting it with a reducing gas at elevated temperatures. D.J.B.

Preparation of kaolin catalysts. George A. Mills and Gerhardt Talvenheimo (Houdry Process Corp.). U. S. 2,848,423, Aug. 19, 1958.—1. A process of preparing granular aggregates of a catalytic contact material from kaolin clay includes the steps of subjecting a plastic kaolin clay containing particles of $>2\mu$ size and finer sized particles to a procedure effective in separating the particles to form a fraction composed of $<80\%$ particles of 2μ size and smaller, shaping the fraction consisting predominantly of such 2μ size and smaller particles of such plastic kaolin into granular aggregates, subjecting such aggregates to an elevated temperature treatment to form attrition resistant aggregates, subjecting such heat-treated aggregates to a gas stream containing hydrogen sulfide at <1200°F. to form partially reacted aggregates, subjecting such partially reacted aggregates at an elevated temperature to a reactant gas containing ammonium chloride for the selective removal of a portion of the iron content of the kaolin to purify the kaolin, and subjecting the purified aggregates to further heat-treatment to prepare granular aggregates of a cracking catalyst possessing a significantly higher activity for the cracking of high boiling hydrocarbons to hydrocarbons of the gasoline boiling range than granular aggregates prepared from particles having a particle size $>2\mu$. D.J.B.

Silica-alumina-chromium fluoride catalytic compositions, their preparation, and their use in hydrocarbon conversions. Alfred E. Hirschler (Sun Oil Co.). U. S. 2,849,382, Aug. 26, 1958.—1. A catalyst for the conversion of hydrocarbons consists essentially of a synthetic silica-alumina composition impregnated with 4 to 19% by weight, based on the final composition, of chromium fluoride, the radius of the pores of the catalyst being 135 to 300 a.u., and the surface area of the catalyst being 20 to 90 $m.^2/gm.$ D.J.B.

Additional abstract

Sect. III: Thermodynamic investigation of the solid reactions in silicate systems.

XV—General

Ceramics and nuclear energy. Celestino Ficai. *Faenza*, 44 [2] 40–46 (1958).—The principles of nuclear energy, the theories involved, and methods of practical utilization are explained. Apparatus and installation are described, and ceramic materials utilizable in the construction of equipment, in control, and in protection from radiation are discussed. 1 figure. M.Ha.

Ceramographic exhibit. Anon. *Am. Ceram. Soc. Bull.*, 37 [9] 419 (1958).—Three winning photomicrographs are shown. Cf. *ibid.*, 36 [7] 283 (1957).

Economic trends in the ceramic industry. C. W. Planje. *Am. Ceram. Soc. Bull.*, 37 [9] 414–15 (1958).

Glamour course for other engineering students. Lane Mitchell. *Am. Ceram. Soc. Bull.*, 37 [9] 417 (1958).—The Georgia Institute of Technology offers an elective course in ceramic materials and processes for students enrolled in other curricula. Since it was initiated, more than 5000 men have taken the course.

Guide to materials standards and specifications: 5, Nonmetallics (except plastics and rubber). S. P. Kaidanovsky. *Materials in Design Eng.*, 48 [1] 93–95 (1958).—Standards and specifications prepared by Government agencies and national organizations are compiled. Of ceramic interest are those tabulated under glass, mica, asbestos, and mineral wool and some under the miscellaneous group, such as thermal insulation, cemented carbides, and ceramics for electrical uses. D.J.B.

Materials for a space traveler. Rodney A. Jones. *Metal Progr.*, 74 [1] 78–82 (1958).—J. summarizes the effect of high vacuum, solar radiation, meteorite dust, cosmic rays, zero gravity, and ionized atoms on materials used in space vehicles. No specific materials are mentioned. 2 figures. D.J.B.

New developments in ceramics. John H. Koenig. *Materials in Design Eng.*, 47 [5] 121–36 (1958).—K. discusses ceramics for nuclear, high temperature, electrical, and mechanical uses. Recent developments in the most important materials in each field are covered. Properties are discussed and tabulated with some suggested uses. This review is very complete and forms Manual No. 148 of *Materials in Design Eng.* It is available as a separate reprint. 11 photos, 15 references. Cf. *Ceram. Abstr.*, 1958, Feb., p. 60*a*. D.J.B.