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CERAMIC ABSTRACTS

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of clay and shale can be prepared and are useful when the fabric of a clay deposit is of importance. If the sample retains moisture it may be impregnated by a waxlike polyethylene glycol compound (Carbowax 6000) to give the material increased strength. If a special collecting technique is employed slow drying results, and the clay is hard enough for thin section preparation by a procedure only slightly different from that used for rocks. 3 references. J.E.C.

Transmittance and reflectance of aluminum oxide films in the far infrared. Louis Harris and John Piper. *J. Opt. Soc. Am.*, **52** [2] 223–24 (1962).—The transmittance and reflectance of films 700 to 2800 A thick were determined at 15 to 118μ. Values of *n* and *k* were calculated. 3 figures, 3 references. J.J.D.

Transverse diffusion in saturated isotropic granular media. Akio Ogata. *U. S. Geol. Survey Profess. Paper*, 1961, No. 411-B, 9 pp. 15¢.—An analytical method is presented for determining the ionic diffusion transverse to the direction of flow of a fluid in granular media. The basic assumption that the frontal zone created by longitudinal dispersion is fully developed and stationary before the transverse diffusion can cause spreading is made to simplify the mathematical analysis. The results of numerical computations are presented in graphical form. 3 figures. M.J.K.

Use of the Lange photoelectric colorimeter for the determination of iron in silicates. Peter Mandt. Translated in *Interceram*, 1961, No. 1, pp. 18–25; for abstract see *Ceram. Abstr.*, 1961, Sept., p. 226*f*.

Verification of existence of cubic zirconia at high temperature. Deane K. Smith and Carl F. Cline. *J. Am. Ceram. Soc.*, **45** [5] 249–50 (1962). 3 references.

X-ray diffractometer cryostat providing temperature control in the range 4° to 300°K. Floyd A. Mauer and Leonard H. Bolz. *J. Research Natl. Bur. Standards*, 65C [4] 225–29 (1961).—A diffractometer cryostat was modified to provide a means for controlling temperature and for confining the vapor in equilibrium with volatile samples. Materials with vapor pressures as great as 1 atm can be handled without loss of insulating vacuum, and temperatures can be controlled with an accuracy of ±0.1°K in the range 4° to 20°K, decreasing to ±1.0°K at 300°K. Data on the lattice constants and thermal expansion of neon are given to show the suitability of the apparatus for maintaining a desired temperature while working with a volatile material. 4 figures, 7 references. M.J.K.

X-ray methods for oxide analysis. Kenneth P. Borror and E. A. Fisher. *Ceram. Age*, **77** [4] 40–42 (1961).—To obtain the desired degree of chemical control for neutron absorbing additives to a high alumina ceramic, an X-ray spectrographic method was developed for the analysis of 0.6 to 3.0% Gd_2O_3 and 2.1 to 3.0% Sm_2O_3. General considerations, preparation of standards and samples, selection of equipment, analytical procedures, and an evaluation of results are presented. 2 figures, 4 references. P.E.R.

PATENTS

Grating spectrometers or analyzers. Albert E. Martin (Sir Howard Grubb Parsons & Co., Ltd.). U. S. 3,015,984, Jan. 9, 1962. D.J.B.

Mass spectrometry. Lewis Friedman (United States of America as represented by the U. S. Atomic Energy Commission). U. S. 3,016,459, Jan. 9, 1962.—A method for improving the resolution qualities of a mass spectrometer in which nonconducting films are built up on the walls comprises adding a beta emitting material to each sample being tested for discharging before testing and thereby creating a leakage path in the film to prevent the accumulation of a static electric charge on the interior walls of the spectrometer which would adversely affect the resolution characteristics. D.J.B.

Method of preparing a chemical blank sample. George E. Shaffer, Jr., and George W. Schneider, Jr. (Milton Roy Co.). U. S. 3,015,544, Jan. 2, 1962.—For optical comparison of a test sample and a blank sample, the method of preparing the blank sample comprises mixing reagents in defined amount and sequence, the first reactive with a unique component of a fluid medium to result in an optical effect and the second effective to shortstop reaction between the reagent and the component, and thereafter mixing with an aliquot portion of fluid medium to be analyzed for the unique component. D.J.B.

Production of artificial crystals. Charles B. Sawyer (Sawyer Research Products, Inc.). U. S. 3,013,867, Dec. 19, 1961.—The method of growing a pegmatitic crystal comprises thermally inducing a circulation of nutrient solution in each seed-growing region through separate paths of movement and simultaneously permitting the solution to infiltrate from one region to the other at a rate insufficient to affect the circulation while completely preventing infiltrating exchange adjoining the peripheries of the regions at the interconnecting area. D.J.B.

Supports for use in chromatography, etc. Joseph Kopp. U. S. 3,018,000, Jan. 23, 1962. D.J.B.

Wedge for a double beam spectrophotometer. William A. Pliskin (Texaco, Inc.). U. S. 3,016,800, Jan. 16, 1962. D.J.B.

XV—General

Future for ceramics—M/DE Manual No. 187. Malcolm W. Riley. *Materials in Design Eng.*, **54** [3] 133–40 (1961).—R. summarizes expectations of more reliable, more reproducible, and more predictable performance capabilities of ceramic materials. Improved ductility, cermets, "mosaic ceramic," fiber-reinforced ceramics, hot pressing, nucleation, and injection molding are discussed. 4 figures, 17 references. D.J.B.

Materials Selector Issue. Anon. *Materials in Design Eng.*, **54** [5] 550 pp. (1961).—Materials are compared on the basis of specific end service requirements and then grouped as to type with tabulations of properties. Mechanical and electrical ceramics, mica, refractories and cermets, glass, and graphite are included in the nonmetallic section. Porcelain enamel, ceramic, cermet, and refractory coatings are included in finishes and coatings. D.J.B.

Particle technology—the little things in life. Charles E. Lapple. *SRI* (Stanford Research Inst.) *J.*, 5 [3] 94–102 (1961).—L. defines fine particle sizes and types and gives a general survey of their intrinsic or definitive, application, and functional properties and processing. A chart shows equivalent sizes, methods of size analysis, types of gas cleaning equipment, and settling rates for typical particles and gas dispersoids. 1 figure. D.J.B.

Particles in health and disease: II, Respiratory system. C. N. Davies. *SRI* (Stanford Research Inst.) *J.*, 5 [3] 123–25 (1961).—The lung structure and operation are described as related to the prophylaxis, cure, and prevention of dust diseases. D.J.B.

Particles in production: I, Chemical process industries. Russell C. Phillips. *SRI* (Stanford Research Inst.) *J.*, 5 [3] 103–107 (1961).—P. discusses, with brief examples, the role of fine particles as products, process aids, and nuisances, such as scales, and the fissio-chemical process. **II, Dividing line in minerals.** R. J. P. Lyon and G. A. Parks. *Ibid.*, pp. 107–11.—The authors review the physical and chemical techniques of handling minerals as fine particles and propose some research problems. D.J.B.

Role of materials in cryogenics—M/DE Special Report No. 185. Donald Peckner and Malcolm W. Riley. *Materials in Design Eng.*, **54** [1] 107–18 (1961).—The engineering properties and the evaluation and testing of materials for low temperature applications are discussed. Glass is mentioned briefly, including borosilicate (BSC-2), which has negligible fatigue below −323°F, and the use of silica aerogel, perlite, calcium silicate, and diatomaceous earth as insulation. 23 figures, 8 tables, 20 references. D.J.B.

Nikita Aleksandrovich Toropov. Anon. *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk*, 1958, No. 6, p. 798.—A short biography is given of Professor Toropov, leading Soviet chemist working in the field of silicate chemistry, ferrites, cement, etc. A.A.

What about research? Anon. *Ceram. Age*, **76** [4] 22–73 (1960).—A comprehensive report is given on research programs in ceramics at the following contract research institutes: Armour Research Foundation, Battelle Memorial Institute, Franklin Institute, Horizons, Inc., Arthur D. Little, Inc., Mellon Institute, Midwest Research Institute, Southern Research Institute, Southwest Research Institute, Stanford Research Institute, and Trionics, Inc. Cf. *Ceram. Abstr.*, 1961, Sept., p. 227*f*. P.E.R.