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the carrier. A catalyst prepd. by depositing Ni on Al_2O_3 with broad pores has a high degree of activity and stability. That prepd. by deposition on fine-pored Al_2O_3 is much less active. J. Rovtar Leach

The activating action of calcium in multicomponent catalysts. Alfons Krause and Ludwik Schulz (Univ. Poznań, Poland). *Roczniki Chem.* 32, 1191-3(1958)(German summary).— $\text{Ca}(\text{OH})_2$ shows superadditive activity in the ternary catalyst composed of $\text{Fe}(\text{OH})_3$, $\text{Cu}(\text{OH})_2$, and $\text{Ca}(\text{OH})_2$, when acting on the H_2O_2 decompn. at 37° . Pure $\text{Ca}(\text{OH})_2$ is inactive. The activity of lime appears usually in complexes with Cu^{++} . The possible radical structure of such catalysts is discussed. A. Kreglewski

Sulfonic acid ion-exchange resins based on polystyrene and formaldehyde. A. A. Vasil'ev and A. A. Vansheidt. *Zhur. Priklad. Khim.* 31, 1692-7(1958); cf. *C.A.* 53, 2734g. —Emulsions of polystyrene (mol. wt. about 100,000) were sulfonated with H_2SO_4 in the concn. range from 92% to oleum contg. 65% SO_3 . In all cases not less than 6 parts of oleum/part polystyrene were required regardless of the initial concn. of the acid. When less than the optimum amt. of acid was used the resins obtained had the same ion-exchange capacity, a , but they were insol. in H_2SO_4 , had a high swelling coeff., k (above 10), and low mech. strength. When more acid was used (9:1) k was high. At the optimum ratio of 6:1 sulfonated polystyrene was heated with oleum contg. 5-10% SO_3 , with stirring, up to $205-15^\circ$ till completely dissolved. The soln. was cooled, 1.0-1.1 moles CH_2O /link of polystyrene was added with stirring, heated gradually to $130-50^\circ$, cooled, pulverized, washed with H_2O , 2-3 days with N NaOH , regenerated with 2N HCl , and washed with H_2O till neutral to methyl orange. For this resin (SSF), $a = 4.2-4.6$ meq./g. and $k = 2.4-3.2$. SSF was highly selective toward Terramycin and Aureomycin. I. Bencowitz

Application of radioactive sulfur-35 for the determination of sulfo groups in sulfurcarbon. N. P. Drozdov and A. N. Popov. *J. Appl. Chem. U.S.S.R.* 30, 1140-3(1957)(English translation).—See *C.A.* 51, 18391f. B. R. B.

Powdering of ion-exchange resins. V. P. Meleshko, O. V. Chervinskaya, M. N. Romanov, and D. P. Izmailova. *J. Appl. Chem. U.S.S.R.* 30, 854-7(1957)(English translation).—See *C.A.* 51, 15837c. B. R. B.

Secondary processes of amphoteric ionites and the possibility of their practical utilization. A. B. Davankov, V. M. Laufer, and L. A. Shits. *J. Appl. Chem. U.S.S.R.* 30, 887-91(1957)(English translation).—See *C.A.* 51, 17022f. B. R. B.

Ion exchangers. V. G. Austerweil. *Génie chim.* 80, 29-43, 63-78(1958).—This is a comprehensive discussion of basic information on the subject. The following types of exchangers and their uses are described: natural and synthetic minerals, synthetic org.-base exchangers of polycondensation, polymerization, and plastic origin. Other topics discussed are: exchange equil. in terms of electron ptn. reaction, Donnan equil., and mass action; exptl. methods and results for column exchange; ion-exchange membrane processes; applications of ion exchange. E. W. B.

Radiological evaluation of ion-exchange materials. W. Fuchs and F. Gebhardt (Tech. Hochschule, Aachen, Ger.). *M.H. Ver. Grosskesselbesitzer* No. 55, 282-5(1958).—The max. vol. capacity (MVK) of an ion-exchange resin is detd. by its chem. analysis, and is a const. for a given resin. The useful vol. capacity (NVK) of a resin is not a const.; for given dimensions of an exchange filter NVK varies with the filter loading and the rate and concn. of the regenerating soln. Values of NVK for given conditions can be detd. by flowing naturally radioactive KCl solns., or solns. of CoCl_2 contg. Co^{60} , through the exchange filter. Continuous measurements of radioactivity may be made on the effluent directly, or on a series of samples of the effluent, so that the concn. in the effluent and time of break-through can be detd. Data are presented for Lewatit S 100, Lewatit KSN, and Amberlite IR 120 resins. Roger W. Ryan

Chemical stability towards radiation of ion-exchange resins. Action of γ - and β -irradiation on cationites. A. P. Polevodov, V. A. Nikashina, A. V. Gordievskii, M. M. Senyavin, and A. Kh. Breger (D. I. Mendeleev Chem.-Technol. Inst., Moscow). *Nauch. Doklady Vysshe Shkoly, Khim. i Khim. Tekhnol.* 1958, 761-4.—Under the influence of γ -irradiation the capacity of the resins studied is some-

what lowered. The decrease is almost insignificant in the case of the cationites KU-1, KU-2, and RF (from 3 to 9%). The capacity of SBS is increased by 11% with 5×10^7 röntgens and is decreased by a further increase in the irradiation. KB-4 (a carboxylic resin of aliphatic structure) is the least stable to the action of γ -quanta. Its capacity is decreased by 17% for a 3×10^8 -röntgen irradiation. The reason for the difference in the decrease in capacity of carboxylic, sulfo-, and phosphoric acid resins is apparently the different stability toward radiation of the groups COOH , H_2PO_4 , and SO_3H . A variation in the swelling capacity of the resins indicates either a destruction or a "stitching" of the cationites. The swelling capacity varies sharply, especially at doses $<10^8$ röntgens. The swelling capacity of PhOH-HCHO cationites (RF, KU-1) increases with the dose, i.e. destruction of these resins occurs; that of SBS (a sulfon-resin with cross-linked butadiene components) increases in the interval $5 \times 10^7 - 5 \times 10^8$ röntgens, and that of KU-2 (sulfopolystyrene resin in which divinylbenzene is the bridge-forming agent) remains unchanged at the above mentioned doses, and sharply decreases (also SBS) with a γ -irradiation $>10^8$ röntgens. The max. value of oxidizability was observed for KB-4 (a 4-fold increase at 3×10^8 röntgens). This indicates the slight stability towards radiation of the aliphatic components of the resins. The most stable is KU-2. The capacity of all cationites studied decreases with an increase in the β -irradiation. The sulfocationite KU-1 showed the smallest decrease ($\sim 2.5\%$), while KB-4 decreased the most (45%). The cationites KU-1, SBS, and KB-4, irradiated by 5×10^7 röntgens showed an increase in their swelling capacity. The swelling capacity of RF decreases for doses up to 5×10^7 röntgens, and increases for greater doses; that of KU-2 decreases with an increase in the dosage. The data concerning the chem. stability of the resins is in complete agreement with the data concerning the swelling capacity. KU-2 is the most chemically stable. The action of γ -rays is observed to be more destructive than that of α -particles for the same integral dosage. Jean Plamondon

Reversibility of ion-exchange processes on cation-exchange resins. E. A. Bozhevol'nov. *Trudy Vsesoyuz. Nauch. Issledovatel. Inst. Khim. Reaktivov* 1956, No. 21, 105-7; *Referat. Zhur., Khim.* 1956, Abstr. No. 57704.—A series of expts. is described in which 2 samples of cation-exchange resin in Sr (from labeled Sr) and the other in H, K, Ba, Mg or Pb form, are brought to equil. with the identical vols. of electrolyte (0.05M HCl). Equal samples of the cation-exchange resin contain equal amts. of sorbed Sr. This indicates that in all investigated cases the ion-exchange sorption is reversible. V. S. Mihajlov

Fundamental aspects of the fight against corrosion in the chemical industry. R. Marpon. *Peintures, pigments, vernis* 34, 491-8(1958).—The corrosive atm. usually encountered in the chem. industry requires not only an appropriate carefully selected protective coating on materials subject to corrosion, but equally, frequent inspections and recoatings. Andries Voet

Industrial toxicology of some chlorinated hydrocarbons. M. Šarić and Jelica Knežević (Inst. Med. Research, Zagreb, Yugoslavia). *Arhiv. hig. rada* 8, 251-69(1957)(English summary).—Investigations of the action of CCl_4 , hexachloroethane, and hexachlorocyclohexane on 81 workers in dry cleaning shops and a drug factory were examd. The min:globulin ratio. T. Bičan-Pister

Toxic hazards: asbestos. George E. Morris. *New Engl. J. Med.* 260, 141(1959).—Max. allowable concn. of asbestos in industrial atms. is 5,000,000 particles/cu. ft. of air. Persons with previous pulmonary or cardiac disease should not be employed where exposure to asbestos dust is a problem. X-ray study of the chest and phys. examn. annually should be required of all persons employed in dusty asbestos operations. The signs and symptoms of asbestosis are described. Marion Horn Peskin

See also: Prepn. of cellulose derivs. with ion-exchange properties (Iritani) 23.

Patents: Plaster for mounting elec. app. (Drummond) 20. Polymeric sulfonamidoalkyl vinyl derivs. [ion-exchange resins] (Melamed) 31. Ceramics of low dielec. loss [insulators] (Compagnie générale de télégraphie sans F. I.) 19. Improved epoxide resin compns. (McDowall) 31.