

outgrowth of work done in the Chemical Warfare Service to develop soda-lime for military purposes. Soda-lime for industrial purposes, however, must have much greater activity and capacity and, on the other hand, need not be so hard and need not contain an active oxidizing agent, both of which requirements seriously limited the efficiency of the soda-lime used for military purposes. The paper describes extensive experiments designed to determine the best method of manufacturing soda-lime in order to get maximum activity and capacity against the different gases. The factors determining the brand of lime to use and the best percentage of caustic soda and water were found to be the most important variables after the basic method of manufacture was decided upon. Slides will be shown to indicate the effect of each of these variables on the efficiency of the resulting product against  $\text{CO}_2$ ,  $\text{SO}_2$ , phosgene, chlorine, superpalite and hardness. The final formula developed as the result of these experiments has been used with great success for a variety of commercial purposes and has been found to be many times as efficient as any of the commercial grades now on the market which are made by radically different processes and contain much more alkali.

*Flow of viscous liquids through pipes:* ROBT. E. WILSON and M. SELTZER.

*New solvents for rosin extraction:* H. K. BENSON and A. L. BENNETT. The use of Douglas fir as a source of rosin and turpentine is discussed and the method of tapping the forest trees now in use to a limited extent is described. Attention is called to the very large quantities of resinous mill waste which could be made available for rosin production under proper organization. Realizing that rosin extraction has been under a heavy handicap due to the retention of the solvents by the wood to an extent of as high as 25 gallons per cord in some commercial plants, a search for more easily recoverable solvents was undertaken. Among those that lend themselves to rosin extraction are 5 per cent. ammonium hydroxide and 70 per cent. denatured alcohol solutions. Analytical data are presented on the effect of time and size of wood, on the efficiency of extraction, the decomposition of the ammonia extract, the separation of humus from rosin and the recovery of ammonia from the wood by steam distillation. The following conclusions are presented: (1) When resinous wood of pulp size is treated with 8 times its weight of 5 per cent. ammonium hydroxide for 10 hours 94.5 per cent. of the rosin is extracted.

(2) The ammonia extract decomposes slowly in the air at ordinary temperatures and at  $90^\circ$ – $100^\circ$  C. is rapidly and completely decomposed yielding ammonia vapor and finely divided rosin and humus in suspension. (3) Humus does not retain more than 1.7 per cent. of petroleum ether upon heating at  $100^\circ$  C. for thirty minutes. (4) Wood chips saturated with ammonia solution give off the ammonia completely when steam distilled. (5) Denatured ethyl alcohol at a dilution of 70 per cent. is as efficient a solvent for rosin as ammonia, benzene, turpentine or petroleum ether.

*Comparative study of vibration absorbers:* H. C. HOWARD. A simple instrument for obtaining records of horizontal and vertical vibration in buildings was constructed. Comparative measurements of the vibration absorbing capacities of various materials and devices, such as cork, felt, rubber air-bags, rubber balls and suspensions were made. Certain arrangements of rubber balls were found to be very effective.

*Note on catalysis in the manufacture of ether:* HUGO SCHLATTER. Senderens' experiments (*Comptes Rendus*, Volume 151, page 392) on the action of aluminum sulphate in the manufacture of ether were repeated in glass apparatus and confirmed. When the same experiments were carried out in a small ether still constructed of lead, no difference in production was observed between the usual method of procedure and the process in presence of aluminum sulphate. The author's conclusions are against Senderens' theory of the formation of a double salt, inasmuch as not only lead sulphate, which is normally present in the lead stills used in factory practise, but broken porcelain also gives the same results as aluminum sulphate.

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