

Foreign Abstracts and Patent Review

Influence of Fluxing Materials on Grinding. The fluidity of the slurry prepared in the plant for producing portland cement clinker depends to a considerable degree upon the extent to which the raw materials entering the mill can be disintegrated by washing. An investigation was made to determine the influence of the fluxing material on the disintegration rate of a mixture of marl and chalk (76% CaCO_3) in the wash mill. The grinding tests were conducted on raw materials in laboratory type ball mills. The marl and chalk were crushed in a Black crusher and passed over screens having 1- and 4-mesh per sq. cm., respectively. The overs of marl and chalk upon the 4-mesh screen were then mixed together in the required proportion. Then two batches, each of 1 kg., were weighed out and placed in two porcelain drums of similar size which contained porcelain balls of like weight and number. One drum received water without any fluxing material; the other drum received a 0.04 N Na_2CO_3 and a 0.1% molasses solution (based on the weight of the weight of the slurry). Both drums, hermetically sealed, were placed in the same mill.

Grinding was maintained for 30 minutes. A screen analysis and an analysis by elutriation was then made in the Schoene apparatus. The results are given in Table I.

TABLE I—GRINDING ANALYSIS OF RAW SLURRY

Screen (per sq. cm.) and fractions	Size of granules mm.	Percentage— With fluxing material	Without fluxing material
4 mesh	> 3	21.56	26.27
25 mesh	3-1.2	0.82	1.12
64 mesh	1.2-0.75	0.08	1.13
120 mesh	0.75-0.54	0.05	0.07
400 mesh	0.54-0.30	0.10	0.12
900 mesh	0.30-0.20	0.09	0.11
IV fraction	0.20-0.04	2.10	2.79
III fraction	0.04-0.025	0.77	1.62
II fraction	0.025-0.01	4.43	9.24
I fraction	under 0.01	70.00	58.53

They indicate the accelerating influence which the fluxing material exerts upon the reduction in size of the raw material.

The effect of the action of the electrolytes may be increased by first heating the water which is to be used; the water is thus considerably softened. In order to decrease the volume of water used in the slurry in actual operation, soda and molasses can be used individually or in various mixed proportions, in dependence upon the condition of the water. The introduction of the electrolytes decreases the consumption of fuel, increases the output of the kiln, crushers and pumps, and calls for smaller bins and tanks.—*Zement* (1930), 19, 5, p. 96.

Investigation of Concrete Building in Prague. In October, 1928, newspapers the world over carried the news that a corner building being erected of reinforced con-

crete in Prague, Czechoslovakia, had collapsed and killed 46 people. According to the legal opinion of the investigating expert, Prof. Rudolf Kukac, Prague, the collapse of the building under construction was due partly to faulty mixing and pouring of the concrete and to weaknesses in design. According to the evidence, there was nothing wrong with the cement, but plenty with the men in charge.—*Beton u. Eisen* (1929) 24, pp. 447-448.

Sand-Lime Brick Production. The author gives the elementary principles relating to the production of sand-lime products, from the preparation of the raw material to the finished material. According to the experiences of Leduc, the purity of sand exerts a great influence upon the strength of the product obtained. Products made with siliceous sand have a strength of 180 kg. per sq. cm.; but if 10% clay is added, the strength is only 110 kg.; and when 10% limestone (CaCO_3) is added, it is only 107 kg. Cinders and slag are used in sand-lime products. Leduc states that a cinder of the following composition is used in England: SiO_2 , 40.60%; Al_2O_3 , 18.50%; Fe_2O_3 , 22.80%; CaO , 11.20%. This gives a sand-lime product of the following composition, when 8 1/2% of lime is added: SiO_2 , 32.50%; Al_2O_3 , 14.80%; Fe_2O_3 , 18.20%; CaO , 17.00%; MgO , 5.5%; combined water, 12.00%.—*Rev. des Mater. de Constr. et de Trac. Pub.* (1929) 242, pp. 419-422.

The "Boehmite" of the Bauxites. Hocard and de Lapparent, in a recent paper delivered at the French Academy of the Sciences meeting, report that one of them has indicated in certain bauxites the existence of microscopic crystals of a mono-hydrate of alumina ($\text{Al}_2\text{O}_3 \cdot \text{H}_2\text{O}$), which he designated *boehmite*, of orthorhombic symmetry but differing from *diaspore* in certain ones of its properties.

Previously Boehm, in studying the radiograms, realized by the action of x-rays (Debye and Scherrer process) upon certain hydrates of alumina and on some bauxites, had shown that the existence of a mono-hydrate of alumina can be deducted, which he designated bauxite homologous with the *lepidocrocite* ($\text{Fe}_2\text{O}_3 \cdot \text{H}_2\text{O}$), the *diaspore* being the other part homologous to the *goethite*.

The identity of the *Boehmite* and the bauxite of Boehm appeared infinitely probable, but it had not been clearly shown, until these investigators' findings.

With some radiograms obtained by one of the authors (Debye and Scherrer process) of the *lepidocrocite* as well as the *boehmite*, they have been able to amass small crystals in sufficient number (bauxites of Percille,

Ariege) showing a correspondence of lines which left no doubt as to the structural relation of these two minerals. Moreover, the lines of the radiogram of the "*boehmite*" corresponded also to those that can be observed in the radiogram of "*bauxite*" obtained by Boehm.

There can now remain no doubt as to the identity of the *bauxite* of Boehm and the *Boehmite*, and as to the composition of the latter.

The theories made by one of the authors on the diaspora of certain bauxites from the Fenouillet deposits, is confirmed by an accurate radiogram of these bauxites, and shown to correspond to a radiogram of *goethite*. Thus, the homology of the *boehmite* and of the *lepidocrocite* on one hand, and the diaspora and the *goethite* on the other hand, is found to be clearly proven.—*Ciment* (1930) 35, 1, p. 8.

Mineral Wool Production in France. Slag wool (*laine de laitier*) is a new French product being marketed for use as insulation under the name "*Reforme*." The molten slag, on discharging from the blast furnace, is pulverized by a jet of compressed air. It is then delivered to a refractory-lined vessel where it is kept in fusion by heat supplied from oil burners. The floor of this vessel is perforated to allow the slag to pass through in fine threads to a rotating cylinder. On this drum the threads are cooled by a spray of water so that the threads of fine diameter do not stick to each other while being wound around the drum.

This insulating material resists temperatures to 1500 deg. C., has a density of 0.22, is reasonable in price, has high insulating qualities and has a coefficient of conductivity of 0.05 to 0.06 for temperatures from 200 to 300 deg. C. It is supported on a metal frame and a galvanized grating for packing with a layer of cement to protect the outside.—*Ciment* (1930) 35, 1, pp. 5-6.

Magnesia Cements. The general composition and the conditions encountered in the use of magnesia cements are discussed in detail.—*Ciment* (1929) 34, 12, pp. 613-616.

Recent Process Patents

The following brief abstracts are of current process patents issued by the U. S. Patent Office, Washington, D. C. Complete copies may be obtained by sending 10c to the Superintendent of Documents, Government Printing Office, Washington, for each patent desired.

Washing Sand and Gravel. The method uses two troughs or flumes, one above the other. The feed, as the discharge of a dredge pump, goes into the upper flume and clear water is pumped into the lower to be used as a second wash or rinse. A series of openings in the bottom of the upper flume allows the material to fall into the lower, but these