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MANUFACTURE OF BLEACHING POWDER

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This invention relates to improved means for the manufacture of stabilized bleaching powder by the removal of moisture, the presence of which is known to be one of the chief causes of instability, especially in tropical countries. The dehydration of bleaching powder as an entirely separate operation, using heat from an external source, is described in British Patent specification No. 242,805, and No. 246,000.

Thus it is known that dehydration may be effected by heating the powder in shallow layers exposed to the atmosphere, or by passing a current of heated air or inert gas in countercurrent over the bleach.

Such a method is expensive because of the heat which has to be supplied to the gas in order to raise the temperature of the bleaching powder sufficiently to cause the transfer of water to take place from the bleaching powder to the air, and by reason of extra plant and labour required.

According to the present invention, the manufacture and all or part of the drying of the bleaching powder are combined in one operation. We have discovered that this can be done by taking advantage of the heat of reaction evolved during the manufacture of the bleaching powder. Preferably we circulate a controlled volume of dilute chlorine through the apparatus during the manufacture of the bleaching powder the moisture being removed from the effluent gas (e. g. by cooling) before it is re-circulated.

In this way, valuable economies can be effected:—

(1) By eliminating the heating of a large volume of air or inert gas, required by the original process. This volume of air was necessarily large because it has to raise the temperature of the bleaching powder sufficiently to effect the removal of water. Such an external source of heat is now unnecessary, the heat required for the drying of the bleaching powder being practically completely supplied by that evolved in the reaction between the chlorine and the lime in making bleaching powder.

(2) By carrying out the manufacture and drying simultaneously in one apparatus, thus economizing in plant and labour. The additional plant or labour formerly required for a separate drying process and the cost of transport of bleaching powder from the manufacture to the drying plant are avoided.

The combined operation may be effected in an apparatus of the mechanical type, preferably the Moore rotary tube (British Patent No. 113,457) as impaired stability due to iron contamination from the plant is avoided in this apparatus.

The tube consists of a long iron cylinder suitably supported at intervals by roller bearings and lined with glazed earthenware tiles. It is fixed at an inclination of about 1 in 24 and is caused to rotate by worm gearing. At the upper end is fitted a hopper with ribbon feed for a regular supply of lime and the finished bleaching powder discharges into a suitable hopper at the lower end of the tube.

A slight suction is maintained on the apparatus by a fan which draws the hot exit gas from the lime feed end, through a series of nearly parallel earthenware pipes, arranged as atmospheric coolers. If required, further cooling may be effected by passing the gas through pipes immersed in artificial cooled brine. The condensed water is drained away and the dried exit gas, after adjustment of strength with strong chlorine, is delivered by the fan to the inlet gas pipe of the tube. Any other suitable method of drying may be used e. g. passage in contact with strong sulphuric acid.

A large predetermined volume of weak chlorine is continuously circulated, and in its passage through the tube, the gas temperature is raised to about 60° C. due to reaction heat evolved, thus producing suitable drying conditions.

We have found that satisfactory dehydration is obtained if, say, 10,000 to 12,000 cubic feet per hour are circulated through the tube producing about 32 tons per week of high strength bleaching powder, e. g. containing 37% available chlorine, or thereabout.

The volume of gas used, however, will vary somewhat with its conditions of dryness and type of plant used.

An important feature of the invention con-

sists in the circulation of weak gas, with adjustment of chlorine content, and removal of water, with thermal control. If desired, the inlet gas may be heated to assist in drying when necessary.

By means of the herein described one stage process a substantially anhydrous product is obtained which is especially adapted for use in tropical countries, and is known as "tropical" bleaching powder. Such bleaching powder contains only about ½ to 1½% free water, as compared with about 7% free water in ordinary bleaching powder. Tropical bleaching powder is a known product, which, however, has always been produced in two separate stages, whereas by the present process the product is produced in a single stage operation.

We declare that what we claim is:—

1. A one stage process for producing substantially anhydrous bleaching powder which comprises circulating gas containing chlorine over lime and continuously removing moisture from such gas until substantially all of the free water has been removed from the bleaching powder, the temperature during the reaction being maintained at substantially 60° C.

2. A one-stage process for producing substantially anhydrous bleaching powder which consists in passing dilute chlorine over agitated lime material, and keeping the chlorine so dilute, the moisture content of the inlet gas so low and the temperature such that substantially all free moisture is removed without decomposition of the bleaching powder formed during the reaction.

3. A one-stage process for producing substantially anhydrous bleaching powder which consists in passing dilute chlorine over agitated lime material, and keeping the chlorine so dilute, the moisture content of the inlet gas so low and the temperature such that a bleaching powder containing not materially greater than 1½% of free water is obtained.

In witness whereof, we have hereunto signed our names this 5th day of April, 1929.

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