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PROCESS FOR THE PRODUCTION OF ALKALI METAL PERCARBONATE

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Recently a process for the production of alkali metal percarbonate was found, consisting in gradually introducing an alkali metal peroxide and an alkali metal bicarbonate into a solution containing hydrogen peroxide, solid alkali metal percarbonate and stabilizers. The alkali metal percarbonate formed therein is precipitated by addition of sodium chloride in solid form and the remaining mother liquor containing sodium chloride is mixed again with a hydrogen peroxide solution to be used over again in subsequent operations.

Now it was found that this process may be carried out with special advantage if after complete introduction of the alkali metal peroxide and the alkali metal bicarbonate and the necessary sodium chloride, only one part of the reaction mixture is removed from the reaction vessel, the alkali metal percarbonate separated, whereupon the mother liquor containing sodium chloride and a suitable quantity of concentrated hydrogen peroxide solution is utilized for a new charge and an alkali metal peroxide, an alkali metal bicarbonate and the necessary sodium chloride are newly added.

In carrying out our invention, we may, for instance, proceed as follows:

To 650 liters of a re-employed mother liquor, containing sodium chloride 100 liters hydrogen peroxide solution (40%), a suspension of magnesium silicate as stabilizer in an amount of about 20 liters and 10 kilograms of solid alkali metal percarbonate are added whereupon during a period of about 50–55 minutes 46 kilograms of solid sodium peroxide and 110 kilograms of a solid alkali metal bicarbonate are introduced, either continually or gradually. The temperatures are kept low and should generally not exceed 100° C. Towards the end at the same time or after the step of the bicarbonate-percarbonate addition 25 kilograms of sodium chloride are introduced into the solution mixture. Now 100 liters of hydrogen peroxide (40%), 20 liters of the stabilizer suspension, 46 kilograms of peroxide, 110 kilograms of bicarbonate and 25 kilograms of sodium chlorid are newly introduced into the vessel in accordance with the above described manner. The contents of the vessel are then nearly 1000 liters and contain about 440 kilograms of a solid alkali metal percarbonate. Then about 250 liters of a mother liquor containing sodium chloride, 100 liters of a hydrogen peroxide solution (40%), 20 liters of a stabilizer suspension, 46 kilograms of an alkali metal peroxide, 110 kilograms of an alkali metal bicarbonate and 25 kilograms of sodium chloride are newly added. Nearly 10 minutes after the introduction is finished, part of the whole content of the vessel, for instance, one third of the 1500 liters, is separated by centrifuging to recover the alkali metal percarbonate contained therein. The remainder of about 1000 liters with the alkali metal percarbonate contained therein is kept in the reaction vessel. To these 1000 liters, 250 liters of mother liquor, the corresponding quantities of hydrogen peroxide, stabilizer, an alkali metal peroxide, an alkali metal bicarbonate and sodium chloride are again added.

Working according to our invention warrants an easy introduction, an effective and uniform distribution and therefore a perfect solution and reaction of the alkali metal peroxide and the alkali metal bicarbonate on account of the permanent presence of such a great quantity, for instance, 1000 liters of the reaction mixture in the vessel. The great quantity of alkali metal percarbonate, for instance, about 440 kilograms in 1000 liters of the reaction mixture acts as innoculating salt. The substantial advantage, however, lies in the increased growing of the mono crystal of the alkali metal percarbonate in consequence of the long sojourn of the alkali metal percarbonate in the reaction vessel. In large scale operations this gives result to a product with a hitherto unknown size of grain. Losses through decomposition are insignificant and therefore total yields of oxygen (in the solid salt and in the solution) are nearly 100% and in the alkali metal percarbonate deposited, about 96–98%. The thus formed alkali metal percarbonate shows an excellent stability.

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