

ALIEN PROPERTY CUSTODIAN

PROCESS FOR THE PRODUCTION OF ALKALI METAL PERCARBONATES

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In a new process for the production of alkali metal percarbonate solid alkali metal peroxide and solid alkali metal bicarbonate are introduced into a hydrogen peroxide solution at low temperatures whereby the alkali metal peroxide and the alkali metal bicarbonate are added gradually to a hydrogen peroxide solution which contains sodium chloride, stabilizers, such as magnesium silicate or mixtures of water soluble magnesium salts and sodium silicate and solid alkali metal percarbonate as innoculating salt. The thus formed alkali metal percarbonate is precipitated by addition of solid sodium chloride, the remaining mother liquor which contains sodium chloride again mixed with hydrogen peroxide solution and then reused. We prefer to introduce the alkali metal peroxide and the alkali metal bicarbonate, and if desired, also the sodium chloride, simultaneously into the hydrogen peroxide solution. The process may be carried out between 0-10° C and if necessary, also at slightly increased temperatures.

Furthermore, we have found it advantageous after complete introduction of the alkali metal peroxide, the alkali metal bicarbonate and the sodium chloride to remove only one part, for instance, one third, of the reaction mixture from the reaction vessel. The remaining mother liquor is then used over again for a new charge. This procedure leads to an increased growing of 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 hitherto unknown sizes of grain.

Now we have found that it is not necessary to produce the indispensable alkali metal percarbonate from alkali metal peroxide and alkali metal bicarbonate during the reaction itself. The alkali metal percarbonate per se may be introduced directly into the reaction vessel.

Object of our invention is therefore a modification of the hitherto known processes for the production of alkali metal percarbonate, consisting in substituting the alkali metal peroxide and alkali metal bicarbonate by gradually introducing solid alkali metal percarbonate into the hydrogen peroxide solution which contains sodium chloride, solid alkali metal percarbonate and stabilizers. The thus formed alkali metal percarbonate will by addition of solid sodium chloride be nearly completely precipitated, whereafter the remaining mother liquor containing sodium chloride mixed with hydrogen peroxide solution will be used over again.

The process is particularly suitable in practice where no sodium peroxide is available and the alkali metal percarbonate is made ex soda and hydrogen peroxide.

In the hitherto known processes for the manufacture of alkali metal percarbonate ex soda and hydrogen peroxide it was necessary to use a concentrated, for instance, 20% hydrogen peroxide solution in order to obtain a good yield in oxygen without a too heavy consumption of sodium chloride. The use of concentrated hydrogen peroxide solutions, however, has the disadvantage that the calcined sodium carbonate is very difficult to dissolve on account of its being coated superficially with slimy alkali metal percarbonate, immediately after its introduction in the hydrogen peroxide solution. In consequence thereto only a low percentage of a nonuniform final product is obtainable. If these difficulties are avoided by using low percentage, for instance, 10% hydrogen peroxide solutions, very large quantities of sodium chloride will be needed.

By working to our invention with the utilization of a sodium chloride containing mother liquor in a circulating process, large quantities of liquid are available to dilute, dissolve and distribute the 40% hydrogen peroxide solution. Hereby the aforementioned difficulties are completely overcome and in strict observation of the working conditions, especially the operation in the presence of solid alkali metal percarbonate as innoculating salt, increased yields in combined oxygen and products with uniform percentage and improved stability are obtained.

The utilization of large quantities of liquid makes it also possible to increase the speed of working as greater cooling areas are coming into effect than in working with small quantities of liquid, i. e. with more concentrated hydrogen peroxide solutions.

Example

1000 liters of mother liquor with about 22% NaCl are reacted with 150 liters of 40% hydrogen peroxide and the usual stabilizers, such as magnesium silicate, added. During strong stirring and good cooling 140 kgrs of calcined sodium carbonate is sprinkled cautiously in a time of about 60 minutes whereby the temperatures are not allowed to exceed +12° C. After further ten minutes approximately 30 kgrs NaCl are added to increase the saturation. The stirring is continued for 10 minutes, then at a temperature of +8° C discharged and centrifuged. 220-225 kgrs of alkali metal percarbonate with approximately 12% combined oxygen are obtained, corresponding to a yield in oxygen of 95%. The salt is dried as usual and 1000 liters of the mother liquor are introduced into the vessel for reuse.

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