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PROCESS FOR IMPROVING THE COLOR AND THE BAKING QUALITY OF FLOUR, MEAL, AND MILLING PRODUCTS

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Various substances have already been proposed for the bleaching of flour. These bleaching means act with various intensity and rapidity and moreover in many cases have an influence on the physical properties of the flour as may appear from the following summary:

1. By bleaching means such as nitrogen oxides, nitrosylchloride and the like or combinations of the same a suitable but not the maximum bleaching may be obtained; if the treatment is too strong the color will either immediately or after some time become greyish and the color of the crumb of the bread obtained from the flour bleached in this way is rather bad. Moreover the acidity of the flour may increase considerably when using large quantities of the bleaching agent for obtaining a strong bleaching. This has an unfavorable influence on the quality of the flour which is stored and often the baking quality will even decrease.

2. By applying bleaching means as nitrogen trichloride and chlorine-dioxide a very good bleaching of the flour is possible. Moreover they have an important influence on the physical-chemical properties of the flour. A rather considerable improvement of the baking quality may even be obtained by a treatment with small quantities of these gases. However, these quantities are insufficient to obtain a maximum bleaching of the flour. If, however, such quantities of chlorinedioxide are used that the highest bleaching effect is obtained, the flour of the various kinds of cereals will show a considerable decrease in baking quality.

3. When using the organic superoxide, for instance benzoylsuperoxide, the drawback is met with that the bleaching takes place slowly, the rate of bleaching being dependent on the size of the particles of the superoxide so that only after a considerable time (24–72 hours) the degree of bleaching may be ascertained. As moreover the organic superoxides in this finely divided condition decompose rather easily, for instance by dust particles of organic nature, so that the activity of the stored superoxides decreases, it is generally very difficult to establish the quantities necessary for obtaining a certain degree of bleaching. It has been stated that the bleaching action of the organic superoxides may be accelerated by adding special catalyzers or by heating the flour treated with the bleaching means, but these processes are rather complicated and do not lead to fully satisfying results.

According to the invention a maximum bleaching of the flour with simultaneous improvement of the baking quality may be obtained by using combinations of chlorine dioxide with one or more substances of the group comprising organic superoxides, nitrogen oxides and nitrosylchloride.

Experiments have shown that by adding 0.7–2.0 gr. ClO_2 to 100 kg flour an important improvement of the baking quality is obtained. However, the maximum degree of bleaching of the flour is not yet obtained in the case and the color is often still insufficient. As stated above the bleaching may be increased by using larger quantities of ClO_2 but the baking quality is then considerably decreased.

According to the invention organic superoxides, nitrogenoxides, nitrosylchloride or a mixture of these substances are now added during or after the treatment of the flour with chlorine dioxide. By choosing the right quantities it will be possible to obtain for each kind of flour a maximum bleaching with simultaneous improvement of the baking quality.

It is of special importance to apply simultaneously ClO_2 and organic superoxides for instance benzoylsuperoxide. The inventor has found that the bleaching by benzoylsuperoxide which under normal conditions takes place slowly and is only completed after 24–72 hours, is so much accelerated by the chlorinedioxide that the final bleaching degree is already obtained in a very short time. This is a very important advantage because the degree of bleaching can be immediately ascertained and not only after one or two days, so that the desired quantity of bleaching means can at once be established.

Also for the working of the mill this is

an important simplification because the bleaching after the addition of chlorinedioxide and benzoylsuperoxide is completed in a very short time.

I claim:—

1. A process for bleaching and improving the baking quality of flour, meal and milling products comprising treating the same with chlorinedioxide and a substance selected from the group consisting of benzoylsuperoxide and nitrogen oxides.

2. A process for bleaching and improving the baking quality of flour, meal and milling products comprising treating the same with chlorine dioxide and benzoylsuperoxide.

3. A process for improving the baking properties of flour, meal and milling products while at the same time effecting a maximum bleaching of said flour, meal and milling products comprising treating said flour, meal and milling products with chlorine dioxide and then treating said material with benzoylsuperoxide and a nitrogen oxide while said chlorine dioxide is present for the greater part in undecomposed condition so that said chlorine dioxide may still have an influence upon the action of said benzoylsuperoxide and nitrogen oxide.

4. A process for improving the baking properties of flour, meal and milling products while at the same time effecting a maximum bleaching of said flour, meal and milling products comprising treating said flour, meal and milling products with chlorine dioxide and then treating said material with benzoylsuperoxide while said chlorine dioxide is present for the greater part in undecomposed condition so that said chlorine dioxide may still have an influence upon the action of said benzoylsuperoxide.

5. A process for improving the baking properties of flour, meal and milling products while at the same time effecting a maximum bleaching of said flour, meal and milling products comprising treating said flour, meal and milling products with chlorine dioxide and then treating said material with a nitrogen oxide while said chlorine dioxide is present for the greater part in undecomposed condition so that said chlorine dioxide may still have an influence upon the action of said nitrogen oxide.

In testimony whereof I affix my signature.

WILLY BECHER.