18.8.1 Benzoyl Peroxide

For a long time, benzoyl peroxide was a familiar oxidative bleaching agent and it is still 81 used to this day in many countries. In addition 82 to its good bleaching effect it has a slight influence on the structure of the gluten, but this is not apparent when other flour improvers such as AA are used.

The dosage for benzoyl peroxide is about 5 - 148 10 g to 100 kg of flour (50 - 100 ppm) into the flour stream. It is usually sold as a 27 - 32% product (to enable safe transportation it is diluted with an inert carrier), and the dose is then correspondingly higher. The effect of benzoyl peroxide on the flour is already visible after 6 hours of storage and complete after 24 to 72 hours. Benzoyl peroxide decomposes to benzoic acid (Fig. 132), a substance found in various fruits and berries and used as a food preservative, e.g. in cream and fruit fillings for pastry at dosages of 0.05 - 0.15% (500 - 1,500 ppm).

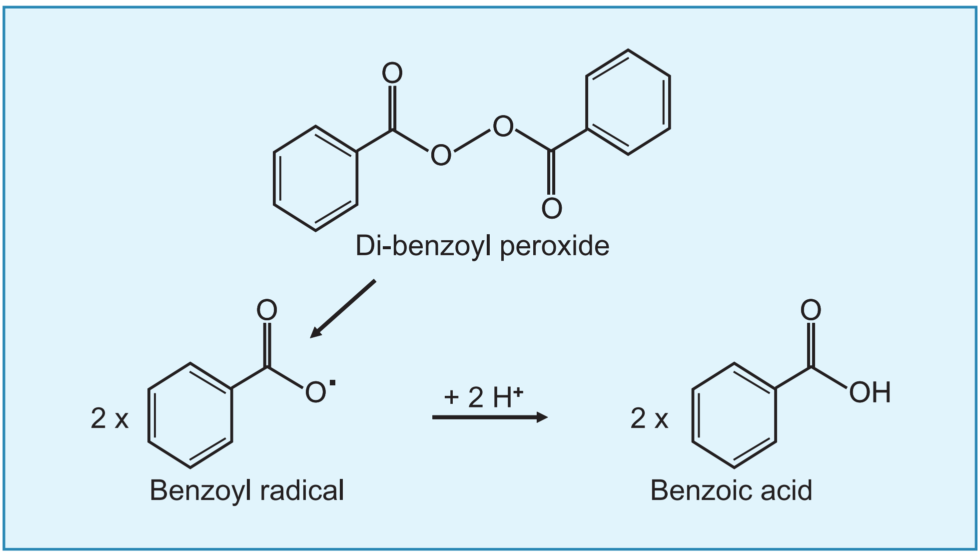

Fig. 132: Decomposition of benzoyl peroxide

18.8.2 Enzyme-Active Bean Flour and Soy Flour

83 Enzyme-active flour made from soy or horsebeans can also be used to achieve a light-coloured crumb. The quantity that can be used is limited by the formation of an undesirable bitter taste. For this reason the maximum quantities used are usually 0.5% for soy flour and 2% for horsebean flour. Another legume from which flour with a bleaching effect is produced is lupin seed. But again, the efficacy is much lower than with soy flour.

The classic application of soy flour is doubtless French baguettes, in which it is increasingly replacing the less effective bean flour. A typical dose of 0.3% already has a definite bleaching effect. It is used at about the same concentration in flours for toast and flat bread. Soy, horsebean and lupin seed flour only become active after the addition of water; they do not bleach the flour in its dry form.

18.8.3 Other Agents with a Bleaching Effect

The brightening effect noticed when ascorbic acid, emulsifiers or some enzymes are used has a physical cause; the finer texture changes the reflecting properties of the crumb and the colour appears lighter (smaller holes have smaller shadows). On the other hand strong oxidizing agents such as bromate or chlorine really do remove the colour from the dark pigments, although this is only a desirable side-effect.

As already mentioned in the section "steamed bread", lipase also has a bleaching effect provided that enough oxygen is present to convert the liberated unsaturated fatty acids – with the help of flour lipoxygenase – into hydroperoxides that then bleach the carotenoids.