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Czech J. Food Sci.

**Šavel J., Koš ů P.,
Broů A.:**

Anaerobic and aerobic beer aging

Czech J. Food Sci., 28 (2010): 18-26

Yellow, orange, red and brown pigments are formed by air oxidation of single polyphenols or by thermal degradation of sugars to caramels. Caramels increase their colours during anaerobic heating or decrease them by air oxidation.

Epicatechin and caramel undergo reversible redox reaction followed by degradation and/or polymerisation at beer aging. That is why both of these colour compounds, besides acting as acid/alkali indicators, can also represent redox indicators that gradually become irreversible. These reactions are accelerated by transient metals or buffering solutions and are therefore more distinct in tap or brewing water than in deionised water. The kind of the brewing water then predetermines not only the beer attributes but also the course of beer aging. Coloured pigments can be partially bleached by reducing agents such as yeast oxidoreductase enzymes and the colour can be then recovered by oxidation; this depends on their

polymerisation degree. Methylene blue and methyl red can be used as artificial oxidation-reduction indicators for the study of the redox potential changes because they act reversibly or irreversibly under aerobic or anaerobic conditions, respectively.

Keywords:

caramel; epicatechin; beer aging; reductone; organic radical; light sensitivity

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