

How do sulfites help to control beer ageing?

Luís F. Guido

*Requimte / Departamento de Química, Faculdade de Ciências da Universidade do Porto,
Rua do Campo Alegre, 4169-007 Porto, Portugal (lfguido@fc.up.pt).
Phone: +351 22 6082944; Fax: +351 22 6082959; E-mail: lfguido@fc.up.pt.*

Paper based on a lecture given at the Chair J. De Clerck XI, Louvain-la-Neuve, September 8th 2004

ABSTRACT

The different aspects of the role of sulfur dioxide in beer are here reviewed. Firstly, the basic properties of sulfur dioxide from a chemical point of view are briefly presented. Promulgation of regulations concerning the usage and labelling of sulfiting agents has promoted the advent of many new analytical methods for determining sulfites in beer and other beverages. Various types of methods are reported and compared with the officially recommended ones. The usage of sulfiting agents in brewing industry has become widespread because of their varied functional uses such as antimicrobials, antioxidants or reducing the flavour impact of a variety of carbonyl compounds.

The contribution of sulfite to control flavour instability of beer will be emphasised in this lecture. Two main mechanisms have been proposed, which are discussed in detail. First, sulfite inhibits beer oxidation during storage by acting as an antioxidant. Sulfite has a radical scavenging activity and avoids the free radical chain reactions during beer storage, contributing to the stability of beer quality. Second, sulfite can react with the carbonyl staling compounds in beer, masking stale flavours. The equilibrium adducts formed between carbonyl compounds and SO₂ have much higher flavour thresholds than the free carbonyl compounds, since these adducts are non-volatile. While the beneficial impact of sulfites on the beer flavour stability has been demonstrated by most authors, there has been a lack of consensus concerning the efficiency of naturally produced bisulfite by yeast, which will be discussed in the light of current data.