

Comparative methods applied for the determination of total iron from beer samples

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Abstract Iron has an important role on the prevention of anemia, which is an important public health problem. Results from studies, conducted in humans and animals, have shown that iron ions (Fe^{2+} and Fe^{3+}) have cariostatic properties. Alone or in combination with other ions, like fluoride and copper, iron has a great effect on the reduction of the cariogenic potential of the sugar. The iron content of beer should be as low as possible. Under normal conditions, the iron content of fermented beer is below 0.2 ppm. If it is higher in the finished beer, a pickup of iron after fermentation is indicated. Iron is said to enter more readily in solution in a beer highly saturated with CO_2 gas. Highly oxidized beers also dissolve more iron. High amount of iron can contribute to color increase due to an interaction with wort and/or beer tannins and hop constituents.

The aim of this work was the implementation and optimizations of some UV-VIS molecular absorption spectrometric methods for determination of total iron from commercial beer samples; the results were compared with those obtained by flame atomic absorption spectrometry (FAAS) using a spectrometer Shimadzu AA 6200. Also, in this study, was compared the efficiency of different digestion procedures (dry ash procedure and digestion procedure with nitric acid) on beer samples. Prior to analysis, the beer samples were degassed. The most appropriate method for the determination of iron in beer was found FAAS and the concentrations obtained were in the range of 0.33 - 1.59 mg/L. For determination of the relative accuracy of the applied methods for iron analysis the "t" test was performed.

Keywords: iron, beer, UV-VIS spectrometry, FAAS
