

MON-44

Direct Determination of Cu, Mn, and Zn in Beer Using Thermospray Flame Furnace Atomic Absorption Spectrometry

Clésia C. Nascentes^a, Joaquim A. Nóbrega^a, Ana Rita A. Nogueira^b, Marco A. Z. Arruda^c ^aDepto Química, Universidade Federal de São Carlos, Caixa Postal 676, S. Carlos – SP, 13560-970, Brazil ^bEmbrapa Pecuária Sudeste – São Carlos – SP - Brazil ^cInstituto de Química – UNICAMP- Campinas – SP – Brazil e-mail: clesianascentes@yahoo.com.br

Beer has indeed become an international drink and some health benefits are associated with moderate consumption of beer. The health implications of trace elements are now well recognized and the concentration of trace elements in food is subject to legislation [1]. The determination of trace metals in beer is relevant because they are essential or toxic in the human body and they can also influence the brewing process. Thermospray flame furnace atomic absorption spectrometry (TS-FF-AAS) was recently proposed [2], and it achieves complete sample introduction and also increases the sample residence time in the flame, thus resulting in better sensitivity. In this system, a Ni tube is placed on a FAAS standard burner head. The sample acrosol is introduced into the tube via a ceramic capillary that is heated by the flame. In this work, TS-FF-AAS was employed for Cu, Mn, and Zn determination in beer without any sample pretreatment. The system was optimized and the standard addition technique was employed for calibration due to ethanol effect in the atomization process in TS-FF-AAS. A sample volume of 300 μ L was introduced into the hot Ni tube using a flow-rate of 0.4 mL min⁻¹ and a 0.14 mol L² nitric acid solution was used as carrier. Different Brazilian beers were directly analyzed after ultrasonic degasification. Results were compared with those obtained by electrothermal atomic absorption spectrometry (ET AAS). The concentration ranges obtained for analytes in the beer samples were: Cu = 38.0 - 152.6 μ g L⁻¹; Mn = 112.3 - 347.9 μ g L⁻¹ and Zn = 52.7 - 226.4 μ g L⁻¹ Results obtained by each technique were in agreement at a 95% confidence level. The proposed method is fast and simple, since sample pretreatment is not required and sensitivity can be improved without using expensive devices. The TS-FF-AAS presented suitable sensitivity for determination of Cu, Mn, and Zn in quality control of brewery.

References

1 - I. Matsushige and E. Oliveira, Food Chem., 47 (1993) 205.

2 - A. Gáspár and H. Berndt, Spectrochim. Acta Part B, 55 (2000) 587.

FAPESP, CNPg

89

PROCI-2004.00146 NAS 2004 SP-2004.00146

