

Turkish Journal of Chemistry

Turkish Journal
of
Chemistry

Determination of Cadmium, Copper, Iron, Manganese, Lead and Zinc in Lichens and Botanic Samples by Electrothermal and Flame Atomic Absorption Spectrometry

Orhan ACAR, Sümer ÖZVATAN, Murat İLİM
Ankara Nuclear Research and Training Center,
06100, Beşevler, Ankara-TURKEY
e-mail: orhana@taek.gov.tr

 [Keywords](#)
[Authors](#)



chem@tubitak.gov.tr

[Scientific Journals Home](#)
[Page](#)

Abstract: Within the framework of the International Atomic Energy Agency (IAEA) Analytical Quality Control Service (AQCS) Chemistry Unit a research program was initiated for the identification of trace elements such as Cd, Cu, Fe, Mn, Pb and Zn in IAEA lichen-338 for a proficiency test (PT). This was to evaluate the possibility of using lichens as biomonitors of trace elements in atmospheric pollution. Pyrolysis and atomization temperatures, atomization and background profiles, detection limits and characteristic masses of analytes in lichen samples with Ni, Ni + Pd and Ni + Pd + tartaric acid (TA) modifier mixture, and without any modifiers were comprehensively investigated by electrothermal atomic absorption spectrometry (ETAAS). The detection limits and characteristic masses of analytes obtained were $0.06 \mu\text{g L}^{-1}$ and 2.04 pg for Cd, $1.26 \mu\text{g L}^{-1}$ and 18.4 pg for Pb, $0.66 \mu\text{g L}^{-1}$ and 6.4 pg for Cu, $0.16 \mu\text{g L}^{-1}$ and 1.42 pg for Mn in ETAAS with (Ni + Pd + TA), and $72.1 \mu\text{g L}^{-1}$ for Fe and $20.1 \mu\text{g L}^{-1}$ for Zn in flame atomic absorption spectrometry (FAAS). Cd, Cu, Pb and Mn in tomato leaves (1573a) from the National Institute of Standards and Technology (NIST) and hay powder (V-10) from IAEA certified reference materials (CRMs) and in lichen samples by ETAAS with Ni + Pd + TA, and Fe and Zn by FAAS were determined. The results obtained in CRMs were in good agreement with the certified values and the recoveries were about 100%.

Key Words: Lichen, ETAAS, Ni + Pd + TA, Copper, Iron

Turk. J. Chem., **29**, (2005), 335-344.

Full text: [pdf](#)

Other articles published in the same issue: [Turk. J. Chem.,vol.29,iss.4.](#)