



Determination of Cd and Pb in biological reference materials by
electrothermal atomic absorption spectrometry:
A comparison of three ultrasonic-based
sample treatment procedures

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Abstract

Three different ultrasonic-based sample treatment approaches, the automated ultrasonic slurry sampling, the ultrasonic assisted acid solid–liquid extraction (ASLE) and the enzymatic probe sonication (EPS) were compared and discussed for the determination of Cd and Pb by ET–AAS in biological reference materials. The sample mass chosen to perform the analysis was 10 mg and the liquid volume was 1 ml of nitric acid 1 M. The best results were obtained with the slurry procedure with which it was possible accurate and precise determination of the Cd and Pb content in four of the five reference materials studied. Optimum performance (total metal extraction) of ASLE assisted by ultrasound for Cd was only achieved in two of the four materials assessed whereas total Pb recovery was only possible in three of the five samples. Total extraction with the enzymatic probe sonication was only obtained for Cd in oyster tissue. Neither ASLE nor EPS were able to extract Cd or Pb from spruce needles. Pb concentration obtained after EPS was found to be highly dependent from sample centrifugation speed and time.

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