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
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Chemistry

Evaluation of sample pre-treatment procedures for the determination of Cr, Ni and V in biological matrices by ETAAS

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Abstract: Electrothermal atomic absorption spectrometry (ETAAS) was applied for the determination of chromium, nickel and vanadium in biological materials (earthworms, feather, lucerne). Three different decomposition procedures of biological matrices are presented. The utilization of $\text{NH}_4\text{H}_2\text{PO}_4$, $\text{Mg}(\text{NO}_3)_2$ and $\text{Pd}(\text{NO}_3)_2 + \text{Mg}(\text{NO}_3)_2$ as chemical modifiers are investigated and compared. Optimal temperature conditions for the electrothermal determination of Cr, Ni and V are selected. Precision of the determination expressed as relative standard deviations for Cr, Ni and V varied from 6 to 22%. The detection limits are for Cr $8 \mu\text{g kg}^{-1}$, Ni $12 \mu\text{g kg}^{-1}$, and V $36 \mu\text{g kg}^{-1}$. The accuracy of the measured data were verified by determination of the studied elements in certified reference materials. The attained analytical results were in good agreement to each other by all applied methods, as well as to the certified values. Consequently, the method was applied to biological matrices: earthworms, feathers and lucerne which were sampled at the refinery immission site.

Key Words: decomposition, electrothermal atomic absorption spectrometry, Cr, Ni, V determination, biological materials.

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