(535)

ATOMIZATION OF DY AND EU IN A TUNGSTEN COIL FURNACE: APPLICATION IN NUTRITIONAL STUDIES

JOAQUIM NOBREGA, Julio C. J. Silva, Ana Rita A. Nogueira, Pedro V. Oliveira University Federal of Sao Carlos, Caixa Postal 676,Sao Carlos, SP, Brazil (Email: djan@zaz.com.br)

The atomization of rare-earth elements in graphite atomizers is not efficient due to the formation of thermally stable carbides. The formation of carbides is critically dependent on the characteristics of the atomizer surface and it is reduced using totally pyrolytical graphite tubes. Carbide formation can be excluded using metallic atomizers and thus the atomization of Dy and Eu was investigated in a tungsten coil electrothermal atomizer (ETA-W). The objective was to develop a procedure suitable for the determination of these elements in fecal samples. Dysprosium and Eu can be employed as markers in animal nutritional studies and the availability of sensitive techniques for their determination allows the use of low amounts of the markers, which is relevant considering that rare-earth compounds are expensive. The ETA-W was adapted on a Varian SpectrAA-640 spectrophotometer and all measurements were performed at 421.2 and 459.4 nm for Dy and Eu, respectively. The use of these wavelengths excluded the use of a deuterium source for background correction. The addition of 10% hydrogen in the Ar purge gas was essential to improve the efficiency of atomization. Considering the pyrolysis curves obtained in diluted nitric acid medium, it was demonstrated that Dy and Eu are thermally stable until 1490 C and 1280 C, respectively. Both elements were atomized at a temperature of 2195 C. Taking into account the matrix constituents, the main interferences were caused by alkaline-earth elements. Preliminary results indicated that these interferences were not completely overcome by using chemical modifiers. Accurate results for the determination of Dy and Eu in acid-digested solutions of fecal samples were attained adopting a matrix-matching procedure. This procedure was easily implemented since the animals studied were fed under controlled conditions and thus the sample matrix is essentially constant. Acknowledgements: CNPq, CNPq/PADCT, FAPESP.