Inorganic elements determination in laboratory animals whole blood samples by EDXRF technique

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Trace elements are of great importance to animal physiology. They activate and inhibit several enzymatic reactions, control permeability of cellular membranes and are co-factors of metalloproteins. Therefore, their concentration in whole blood and serum can be used as a health monitor for laboratory animals, such as Golden Hamster (Mesocricetus Auratus). The conventional biochemistry analysis is performing using serum or plasma applying the Colorimetric, Titrymetry and Ion Specific Electrode. In the last years alternative procedures using analytical nuclear techniques, such as NAA [1] and XRF [2] have become prominent, due to its characteristic such as non-destructive multi-elemental analysis, short time of analysis and small amount of samples requirement (few micro liters) and mainly the possibility to performed analysis in whole blood, an important condition when the biological material is scarce. In the present work, the energy dispersive X-ray fluorescence technique was used to determine Na, Mg, P, S, Cl, K, Ca and Fe elements in whole blood samples. The elemental determination was outlined by Fundamental Parameters method. The samples were obtained from research laboratories (Instituto Butantan and Centro de Pesquisas Aggeu Magalhães). A comparison of the results with Neutron Activation Analysis data was carried out. Both techniques showed appropriate for analysis and offer good perspective in veterinary medicine.

References

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