

**UNCERTAINTY EVALUATION IN THE ANALYSIS OF MUSSELS BY
INSTRUMENTAL NEUTRON ACTIVATION ANALYSIS AND ATOMIC
ABSORPTION SPECTROMETRY**

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Trace elements present in sea water and in marine sediments may be accumulated by many invertebrate marine species as bivalve mollusks such as oysters and mussels. These mollusks are able to concentrate pollutants, in a sedentary way, remaining alive. Their utility as biomonitor organisms enables the estimation of trace element availability to biomass from different areas. A study has been made at the Neutron Activation Analysis Laboratory (LAN) of IPEN-CEN/SP, in which trace and minor elements such as As, Ca, Cd, Co, Cr, Fe, Hg, Na, Se and Zn were determined in some regions of the coast of the State of São Paulo: Cocanha Beach, São Sebastião and Ilhabela by using the *Perna perna* mussel, by means of transplanting these organisms from a clean cultivation site (active biomonitoring). Mussels were transplanted to these contaminated areas for different periods of time. Cd and Hg were determined by Atomic Absorption Spectrometry, AAS, and the remaining elements by Instrumental Neutron Activation Analysis, INAA. For analytical quality control, the NIST Standard Reference Materials SRM 2976 "Mussel Tissue" and SRM 1566b "Oyster Tissue" were analyzed. Another important issue in the quality of measurement results is the evaluation of the measurement uncertainty. In this study, the uncertainty sources for the relative method of INAA and for the determination of Cd and Hg by AAS were assessed according to the Guide to the Expression of Uncertainty in Measurement. Sample and elemental standards activities and analytical curve were identified as the major contribution to the expanded standard uncertainty for INAA and AAS, respectively.