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Vanadium Biomonitoring Using *Perna perna* Mussels Transplanted in North Coast of the State of São Paulo, Brazil

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Environmental pollution by toxic substances has brought great concern globally, especially in estuaries that are impacted due to anthropogenic activities. Bivalve species have been used as biomonitors to evaluate marine contaminations, since they can accumulate trace elements and other substances. In this study, mussel samples acquired in the control region, a mussel farm in Cocanha beach Caraguatatuba, were exposed for three months in the study sites, in São Sebastião, Ilhabela, Ilha das Palmas and Ponta de Itaipu. The mussel samples were cleaned, grinded, homogeneized, lyophilized and then analyzed by instrumental neutron activation analysis (INAA). The INAA procedure consisted in the irradiation of the samples and synthetic standard of vanadium for 8 s, under a thermal neutron flux of 6.6 x 1012 n cm-2 s-1 in the nuclear research reactor IEA-R1 of IPEN-CNEN/SP. The measurements of the gamma radioactivity of the samples and standards were done using a hyperpure semiconductor Ge detector, coupled to associated electronics. For analytical quality control of the results, the certified reference material NIST SRM 1566b *Oyster Tissue* was analyzed and the results presented were precise and in good agreement with the certified values. Comparisons between the V concentrations obtained in transplanted mussels indicated that the São Sebastião region, close to an oil terminal has the highest concentration of V, depending on the period of exposure of mussel samples.

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Raising the temper - μ-spot analysis of temper inclusions in experimental ceramics

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Provenancing of ancient ceramics is a highly important scientific tool for archaeological studies. In general, ceramics are not made from the original clay, as it can be found in deposits. To produce the needed physical properties in the finished product, the clay has to be either tempered by, adding sands or biological materials or levigated, to remove the coarse fraction. Thus, the chemical composition of the finished ceramic differs from the composition of the original clay bed. To overcome this obfuscation, any information that can be gained about the temper used is useful. In a small series, several pieces of ceramic were produced from known clay and tempers and the resulting ceramics analysed by INAA. As many attempts to physically separate the temper from the clay matrix have failed, μ-spot analysis of temper inclusions were performed at the μ-PIXE (Particle induced X-Ray Emission) facility in Rossendorf and by LA-ICPMS (Laser ablation Inductively coupled plasma mass spectroscopy) in Aberystwyth. It could be shown that from a small number of measurements, a general impression of the temper used could be gained, showing if the temper consists mainly of quartz, feldspars or other main components. With this information, dilution calculations can be greatly facilitated, and a close resemblance of the chemical composition of the clay matrix can be calculated.