

## Total Reflection X-ray Fluorescence Analysis of Oysters

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It is already known that bivalves (oysters, clams, mussels) may accumulate large amounts of metals and for this reason they are widely used as bio indicators, but they are also analysed for food safety purposes since elements like Cr, Pb, As, and Cd can be toxic even at low concentrations.

Atomic spectrometry techniques, including flame atomic absorption spectrometry (FAAS), inductively coupled plasma emission spectrometry (ICP-AES), and inductively coupled plasma mass spectrometry (ICPMS), are usually selected for element determination in biological and environmental samples. However, the use of these techniques for solid samples involves the use of acid digestion for the total destruction of organic matrices. This step is critical since involves the use of dangerous reagents and losses of analytes by volatilisation may occur.

Another possibility is the use of total reflection X-ray fluorescence (TXRF) spectrometry technique. In this work, we show the analysis of different reference freeze dried oyster samples provided by Italian Agency for New Technologies, Energy and Sustainable Economic Development (ENEA). The determination of major, minor and trace elements was performed by means of a low-power benchtop TXRF system. A fast and simple analytical method consisting in sample suspension in a disperser solvent has been developed for the elemental analysis of this kind of samples.

Obtained results using the developed method of powdered suspensions were also compared with the analysis of digested samples by means of TXRF. Furthermore, ICP-MS analysis of digested oysters was also performed to evaluate the analytical possibilities of TXRF spectrometry for trace and ultratrace analysis.

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