P05: MULTI-ELEMENTAL ANALYSIS OF OYSTERS BY MEANS OF TOTAL REFLECTION X-RAY FLUORESCENCE

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Bivalves like oysters, clams and musselsare known to accumulate high amounts of metals. For this reason, they have been largely used as bio indicators. However, due to the toxic effects of some elements (As, Cd, Cr and Pb) at even the lowest concentrations, they are also analyzed for food safety purposes.

Generally, atomic spectrometry techniques, as inductively coupled plasma emission spectrometry (ICP-AES) and flame atomic absorption spectrometry (FAAS), are employed for element determination in biological samples. Anyhow, the use of these techniques requires sample preparation procedures for destruction of the organic matrix by chemical treatments. Sample digestion is a critical step in most of the analytical methods and furthermore it is time-consuming and losses of analytes by volatilization may happen.

Another technique that can be successfully used for elemental determination is total reflection X-ray fluorescence (TXRF) spectrometry. In this contribution, different reference freeze dried oyster samples provided by Italian Agency for New Technologies, Energy and Sustainable Economic Development (ENEA) were analyzed. Multi-elemental determination was performed by means of a low-power benchtop TXRF system. The analytical methodology developed consisted in simply suspending the powdered samples in a disperser agent. This procedure is faster, easier and does not involve the use of dangerous reagents.

The results that we have achieved with the present methodology were compared with the analysis of samples after microwave digestion. To evaluate the accuracy of the results, ICP-MS analysis of digested samples was also performed.