TOR VERGATA
UNIVERSITÀ DEGLI STUDI DI ROMA

Dipartimento di Scienze e Tecnologie Chimiche

AVVISO DI SEMINARIO

Il giorno 23 luglio 2019 alle ore 12:00

nell'Aula Seminari del Dipartimento di
Scienze e Tecnologie Chimiche

la prof.ssa Ornella ABOLLINO
Dipartimento di Chimica, Università di Torino

terrà un seminario dal titolo:

Determination of mercury and methylmercury in fish and fishery products with electrochemical methods

Proponente: Prof. Giuseppe Palleschi

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Determination of mercury and methylmercury in fish and fishery products with electrochemical methods

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Fish and fishery products have the capability to accumulate relevant concentrations of mercury in their tissues, so they represent a major dietary source of this element for humans. The potential toxicity of mercury is well known, and strongly depends on its chemical form: in particular, organic derivatives are more toxic than inorganic compounds. The latter undergo methylation by microorganisms present in the environment; methylmercury is one of the most toxic mercury species due to its chemical nature, which causes higher solubility in lipids, higher membrane permeability and greater tissue fixation in comparison to inorganic mercury, and consequently gives rise to high levels of bioaccumulation and biomagnification. For these reasons, the knowledge of the speciation of mercury is fundamental for understanding its impact on biota and on human health. Electroanalytical techniques are suitable for this aim due to their capability to distinguish among different chemical forms, when coupled to proper sample pretreatments, their sensitivity, simplicity and cost-effectiveness.

Our research group has developed a strategy for the determination and speciation of mercury in fish and fishery products based on anodic stripping voltammetry (ASV). The first step involves the determination of total mercury (HgTOT) after mineralization of the sample with nitric acid and hydrogen peroxide. Then another sample aliquot is extracted with HCl, and the extract is driven through a cartridge packed with a resin modified with a ionic liquid (Patent Pending), which selectively retains inorganic mercury (HgIN). The latter is eluted and its concentration is determined by ASV. Finally, methylmercury is obtained by subtracting HgIN from HgTOT. The protocol was validated by analysis of a standard reference material and by comparison with the outcomes of a well established method (Direct Mercury Analyzer, DMA) coupled to another speciation scheme.

An advantage of our determination-speciation protocol is its suitability for field analysis, thus allowing for mercury monitoring directly at the sites of fish distribution or transformation.