Welcome

Il Dipartimento di Scienze Chimiche accoglie il
dott. Fazel A. Monikh
che terrà un seminario dal titolo:

In search of nanomaterials: methods to trace and characterize nanoparticles in complex matrices

Martedì 7 March 2023, ore 17.15 Aula H, Dipartimento di Scienze Chimiche, Via Marzolo, 1.

Engineered nanomaterials (ENMs), generated by manipulating matters on a near-atomic scale, have the ability to revolutionize many industries and are used in many sectors in society such as medicine and computing. Gaining information about the presence, characteristics, and behavior of ENMs in complex matrices such as the environment, consumer products, and the human body is not straightforward and practically challenging. Because there is a limitation in analytics for the characterization and quantification of ENMs due to their trace amount and the presence of different background materials, which interfere with their measurement. Moreover, ENMs undergo different biotransformation in some matrices which may alter their properties, offering them a dynamic behavior. This adds to the analytical complexity.

Starting with the Horizon 2020 project ''NanoDefine'' at the University of Vienna (Austria), I have spent the last 9 years developing methods for nanomaterials characterization in different matrices for different purposes e.g, from environmental risk assessment to medicine and intelligent agriculture. With my collaborator, we have developed a protocol for metallic nanomaterials characterization in biological matrices (https://doi.org/10.1038/s41596-022-00701-x). At the moment, we are trying to circumvent the challenge surrounding the tracing and characterizing microplastics and nanoplastics in complex matrices. I am also trying to develop strategies through which I use nanoscience to find nanoparticles in a mixture of biomolecules.

In this seminar, I would like to describe my expertise and interests to facilitate collaboration with other colleagues at the department and at the university. I will first present some of my research lines and the materials that I would like to focus on which are advanced (nano)materials.

Then, I will present four different studies in which I used nano-analytical chemistry for different purposes. The first study is about the quantification of TiO2 nanoparticles in consumer products using standard materials and orthogonal particle sizing methods for verification. In the second and third studies, I will present the development of methods for the quantification of metallic nanomaterials and nanoplastics in a simulated food chain to support the European Commission's strategies for environmental risk assessment of nanomaterials. The final study deals with understanding how the aging of metallic nanomaterials in nature can influence the interactions between the particles and endogenous biomolecules and consequently affects the formation of a biological corona and the biological fate of the particles.

The main aim of this seminar is to deveolp a common ground and intertes for collabration and sharing infromation with resrachers at UNIPD.

Il Direttore del Dipartimento
Michele Maggini