

From Battery Materials to Nanotoxicology: Applications of (Spatially Resolved) Elemental Analysis and Speciation within BASF

Svenja Seiffert (BASF SE, Ludwigshafen)

As one of the largest chemical companies in the world, BASF boasts an equally extensive product portfolio. A crucial question that arises for nearly all products is related to their elemental composition, from bulk concentration to (ultra-)trace levels.

For instance, determining the primary components of nickel, cobalt, and manganese oxides, which are the cathode materials in most batteries, is essential. Additionally, it is vital to exclude metal contaminants down to ultra-trace levels in products in semiconductor chemicals. These and other inquiries are addressed within BASF's central research department by the Elemental Analysis and Speciation Group. Our team possesses a broad analytical portfolio that enables us to tackle virtually any question regarding elemental components.

This talk will provide an overview of this portfolio, illustrating how we have developed in-house solutions focusing on sample preparation through smart automation and digitalization since 1996. Furthermore, it will highlight current research projects in different EU-funded projects, demonstrating how methods for spatially resolved elemental analysis of nanomaterials in biological tissues are quantified, characterized, and identified. The significance of these advancements will also be discussed, emphasizing their impact on both scientific research and industrial applications.