Contribution ID: **20** Type: **not specified**

Neutron Activation Analysis with Short-Half-Life Radionuclides: Opportunities, Challenges, and Implementation Guidelines

Monday 25 August 2025 15:30 (45 minutes)

Abstract: Neutron Activation Analysis (NAA) remains a widely applied technique at research reactors worldwide, offering multielement, non-destructive analysis with high accuracy. Traditional NAA protocols, typically based on measurements performed several days to weeks post-irradiation, enable the determination of 30–40 elements but often suffer from long turnaround times. This delay has contributed to a declining interest in NAA as a commercial service, particularly in the face of faster competing analytical methods. Short half-life radionuclide NAA presents an underexploited opportunity to significantly reduce analysis times, enabling results within a single working day. This approach not only improves throughput but also extends elemental coverage to nuclides not accessible via long-lived activation products. Despite its potential, implementation has been limited due to technical and analytical constraints, particularly in research reactor environments. This work outlines the requirements for successful deployment of NAA with short-lived radionuclides, focusing on necessary adaptations to irradiation facilities, detection systems, and calibration protocols. The aim is to guide both experienced practitioners and new users in overcoming current limitations and leveraging this approach to enhance the analytical performance and competitiveness of NAA laboratories. While broadly applicable to various neutron sources, the sensitivity data presented primarily reflect research reactor-based configurations. Keywords: Neutron Activation Analysis; short half-life radionuclides; research reactors; irradiation facility design.

Author: BOUNOUIRA, Hamid (CNESTEN-Maroc)

Presenter: BOUNOUIRA, Hamid (CNESTEN-Maroc)

Session Classification: Monday III