

# **Glimpses of R&D Activities in Chemical Sciences for Indian Nuclear Program**

Dheeraj Jain

Chemistry Group, Bhabha Atomic Research Centre  
Mumbai - 400 094

Email: [jaind@barc.gov.in](mailto:jaind@barc.gov.in)

From the beginning of ‘Indian Nuclear Program’ for both, power and non-power applications, indigenous development of materials, processes and technologies has been an important mandate and, has led to notable achievements in a self-reliant manner. With nuclear sector poised for rapid growth to make notably larger contribution in India’s green energy mix, development of innovative reactor systems is imminent. Such developments are primarily strengthened by synthesis of nuclear materials for such reactors, development & standardization of chemical analysis and quality control protocols, thorough understanding of their physico-chemical behavior under postulated reactor operation conditions, delineating the scientific rationale for their performance, and providing indigenous database for their development beyond lab-scale. Chemistry fraternity at BARC is coherently pursuing its research & development activities and contributing to achieve ‘self-reliance’ in the area of nuclear materials’ development. This presentation would cover a glimpse of recent activities wherein indigenous development of materials, processes and technologies for both, the front- and back-end of nuclear fuel cycle have contributed towards Indian Nuclear Programme. Specific role of chemical sciences towards such developments would be highlighted.

**Acknowledgement:** Researchers at Chemistry Group and Radio Chemistry & Isotope Group of Bhabha Atomic Research Centre are sincerely acknowledged for their contributions.