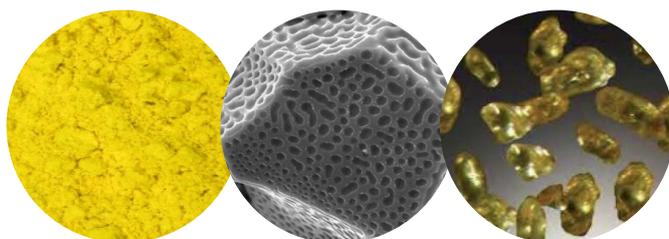


# R&D *in*

pursuit of materials with  
superior properties



Since inception, Materials Group has been contributing positively in realizing Departmental goals of clean energy on a wider scale to benefit large swathes of population in the country. Thanks to its dedicated human resource base, which is equipped with deep understanding of the subject and technical expertise in using sophisticated microscopic and spectroscopic instruments and interpreting the data, BARC Materials Group has overcome many technological challenges including ore dressing, extractive metallurgy, design and development of alloys and their performance assessments under simulated and after actual service conditions. Outcome of sustained high level R&D studies in nuclear material science vis-à-vis technology development has certainly placed our country in a prime position in the world in terms of fission and fusion reactor materials related program.

Besides its notable contributions in Nuclear Energy Program 'from Ore to Core', Materials Group has also been working on alternative energy materials like Fuel cells, Lithium ion batteries, Hydrogen storage materials and various other materials essential for societal and strategic applications. In that respect, the current issue of Newsletter on two interesting themes - Energy Storage Materials, and Advanced Inorganic and Non-metallic Materials is a well timed initiative. In each case, the scientists have been able to develop materials with superior properties for nuclear and specialized non-nuclear applications.

Under the theme Energy Storage Materials, research and developmental activities on energy storage materials giving special emphasis on new generation Lithium based materials have been discussed. Both experimental and simulation studies have been covered in this section. Apart from this, the issue also covers recent advancements in LaNi<sub>5</sub> alloy as a hydrogen storage material. A scientometric study on energy storage material related to publications from India has also been documented.

This issue of BARC Newsletter provides a glimpse of R&D work in development of advanced, efficient and economical energy storage materials for widespread applications in various clean energy programs of the Department of Atomic Energy. This includes recent advancements in inorganic and non-metallic materials for various societal applications like development of ceramics (hydroxyapatite), glass (yttrium alumina silicate) and glass-ceramics for bio-medical and micro device applications, development of new energy efficient materials for LED and others. Synthesis and applications of carbon based materials like carbon aerogel, silicon carbide fibre and particulates have also been covered. A special report on United Nations International Year of Glass – 2022 has also been included in this issue.

I hope this document would not only help the domain specialists but also those from other fields of expertise, especially the young researchers, to develop a brief idea about the front-end research activities in our department in the areas of 'Energy Storage Materials, and Advanced Inorganic and Non-Metallic Materials'.

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