

## Proteins in the design of sustainable plastics alternatives

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The author highlights the use of proteins and their properties as renewable materials. Employing advanced biorefining, processing, and characterization as blended plastics makes this direction viable. The author also examines structure–property relationships and materials design strategies. <https://doi.org/10.1557/s43579-023-00481-9>

## MXenes are materials, not chemicals: Synthesis factors that influence MXene properties

Christopher E. Shuck

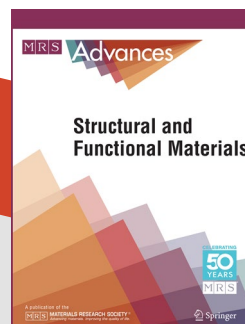
The interesting fundamental properties of MXene materials go beyond popular 2D carbon materials such as graphene. Optical, electric, thermal properties, and more make this a rich playground for both fundamental and application studies. The author highlights the opportunities and challenges of the intriguing properties as monolith and components of composites. <https://doi.org/10.1557/s43579-023-00442-2>

## Analyzing barium titanate TiO<sub>2</sub> surface interactions with *tert*-butylphosphonic acid using density functional theory

Jessica Marvin, James Nicholson, Cedar Turek, Erina Iwasa, Nilay Pangrekar, Whitney C. Fowler, Renee Van Ginhoven, Todd C. Monson

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The authors show a more detailed study on properties of barium titanate (BTO) and its surface properties decoupled from ferroelectric behavior. Modeling enabled prediction of these properties and the ligand binding behavior of BTO. Empirical studies have yet to quantify this interaction, which should give opportunities for more surface-sensitive analytical tools in thin films. <https://doi.org/10.1557/s43579-023-00425-3>



## A snapshot review on flash lamp annealing of semiconductor materials

Lars Rebohle, S. Prucnal, Y. Berencén, V. Begeza, S. Zhou

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The authors review flash lamp annealing (FLA), which is a nonequilibrium annealing method on the sub-second time scale, and discuss the advantages and challenges of this technology. FLA has already been used in microelectronics, mostly after ion implantation, to activate dopants, recrystallize amorphous semiconductor layers, and anneal out defects. FLA has opened up new areas of application like thin films on glass, sensors, printed electronics, flexible electronics, and energy materials. <https://doi.org/10.1557/S43580-022-00425-W>

## A snapshot review of future-oriented standards for cement, admixtures, and concrete: How Africa can spearhead the implementation of green urban construction materials

Wolfram Schmidt, Janina Kanjee, Gosego Motukwa, Kolawole Olonade, Alex Dodoo

Open Access

Concrete has become an integral part of construction technology due to its outstanding structural properties, versatile applicability, and global availability. The authors highlight shortcomings within existing standards of cement and concrete, which are not capable of making full use of current technology capacity. Future-oriented standards are generally required to contribute to a lower-carbon footprint, and these changes are significantly more relevant in sub-Saharan Africa, due to the rapid increase of urbanization. <https://doi.org/10.1557/S43580-023-00563-9>

## A snapshot review on uranyl secondary phases formation in aqueous systems

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Open Access

Irradiated fuel based on UO<sub>2</sub> is expected to be disposed of in an underground repository according to a “once-through” fuel cycle policy. The authors examine the state of knowledge and advances on uranyl secondary phases potentially formed under repository relevant conditions. An overview of likely uranyl compounds that can be formed under repository conditions, as well as the progress made concerning experimental data on the field, is presented. <https://doi.org/10.1557/s43580-022-00476-z>