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Special Issue of Journal of Chemical Sciences on 7th Interdisciplinary Symposium on Materials Chemistry (ISMChem-2018)

Guest Editors: K I PRIYADARSINI · V K JAIN

Editorial

Special issue of journal of chemical sciences on 7th interdisciplinary symposium on materials chemistry (ISMChem-2018)
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Regular Article

Exploring the high-pressure behaviour of polymorphs of AMO$_4$ ternary oxides: crystal structure and physical properties
Daniel Errandonea .............................................. 88

The influence of high pressure on the crystal structure of different ternary oxides is discussed giving emphasis to pressure-driven phase transitions and the consequences of structural changes in optical and vibrational properties. Several examples are examined, general conclusions discussed, and possible future directions for the high-pressure study of ternary oxides proposed.

Regular Article

Future demands for high field MRI diagnostic
Anurag Gautam, Pragya Komal and Ram Sevak Singh ............... 89

The longer tumbling times of NaDyF$_4$ nanoparticles compared to the Ln$^{3+}$ based complexes would be more effective for MRI application, particularly at high magnetic field. Additionally, high density of metal ions (in nanoparticles) per unit of contrast agent with respect to the Ln$^{3+}$ based complexes will enable the MR signal shortening usually, at lower concentrations compared to chelates.

Regular Article

Microneedle-based drug delivery: materials of construction
Shubhmita Bhatnagar, Pradeeptha Reddy Gadeela, Pranathi Thathireddy and Venkata Vamsi Krishna Venuganti ............ 90

Microneedles (MN) bypass the superficial skin layers to deliver molecules to deeper tissues. The material of MN construction has emerged as a critical factor influencing cost, clinical usage, manufacture, drug loading and drug stability. Currently available materials and techniques for MN fabrication and their relevance to scale-up are reviewed.
**Review Article**

Protein: a versatile biopolymer for the fabrication of smart materials for drug delivery

Beena G Singh, Ram P Das and Amit Kunwar .................................. 91

Protein-based materials show wide applications in biomedical fields. The review summarises the physicochemical properties of different proteins derived from animal as well as plant sources that dictate their utility for drug carrier.

**Regular Article**

Cryostructurization of polymeric systems for developing macroporous cryogel as a foundational framework in bioengineering applications

Anuj Tripathi and Jose Savio Melo ............................................. 92

The genesis of a highly porous interconnected architecture by the process of thermally-induced phase separation under cryo-temperature which is commonly known as cryostructurization of polymeric systems to produce porous scaffolds can be synthesized using a variety of polymer precursors for multidisciplinary applications in the fields of biomedicine, environment and bioengineering.

**Regular Article**

Influence of ionic liquids and concentration of red phosphorous on luminescent Cu₃P nanocrystals

Yogendra Nath Chouryal, Rahul Kumar Sharma, Debopam Acharjee, Trisit Ganguly, Archna Pandey and Pushpal Ghosh ......................... 93

This is the first report of rare-earth doped Cu₃P nanoparticles and can promise luminescence aspect of Cu₃P nanomaterials along with its already existing plasmonic and semiconducting properties.

**Regular Article**

Synthesis of acridone-naphthylamine derivative and its thermally-activated delayed fluorescence studies for application in OLEDs

Ankur A Awasthi, Nikita Gupta, Qamar T Siddiqui, Pradnya Parab, Dipak K Palit, Sangita Bose and Neeraj Agarwal ......................... 94

Acridone-amine derivatives was synthesized and its photophysical properties were carried out to establish TADF. It was also used in fabrication of OLEDs.

**Regular Article**

Materials with electronic transitions in the near-infrared

Wolfgang Kaim ............................................................ 95

Some recent examples from ruthenium coordination chemistry are presented in order to illustrate analysis and assignment of Near-Infrared transitions.
A brief review on the effect of preparation conditions on magnetic properties of some \( A_2\text{MMnO}_6 \) (\( A = \text{La, Eu and Y}; \ M = \text{Mg, Co, Ni} \)) type perovskites

S Nagabhusan Achary, Vasundhara Katari, Farheen N Sayed and Avesh K Tyagi .................................................. 96

Sensitivities of structure and magnetic properties \( A_2\text{MMnO}_6 \) types of perovskites to the preparation conditions have been reviewed briefly. Although the deviation in structure is marginal, they also affect appreciably to their magnetic properties. The observed magnetic properties of several \( A_2\text{MMnO}_6 \) types materials prepared under different conditions are summarized in this article.

Materials for nuclear industry: some historical perspectives

P R Vasudeva Rao ............................................................. 97

Materials used in reactors have to meet stringent chemical specifications for efficient performance. This paper describes the development of some nuclear materials such as uranium and plutonium, from laboratory to industrial scale, providing a historical perspective.

Hydrogen storage properties of \( \text{Ti}_2\text{FeV} \) BCC solid solution

Tapas Kumar Das, Asheesh Kumar, Priyanka Ruz, Seemita Banerjee and V Sudarsan ........................................... 98

\( \text{Ti}_2\text{FeV} \) alloy has been prepared by arc melting method and its hydrogen storage properties have been evaluated as a function of temperature. Thermodynamic and kinetic aspects of hydrogen absorption by this alloy have been discussed in detail in the paper.

Evaluation of materials of construction for the sulfuric acid decomposition section in the sulfur–iodine (S–I) cycle for hydrogen production: Some preliminary studies on selected materials

Sachin Tomar, Arpan Pareek, Kishore Kondamudi and Sreedevi Upadhyayula ........................................... 99

In order to identify the suitable materials of construction for sulfuric acid decomposition in the S–I cycle, corrosion rates of different materials were determined. Materials were exposed to the various phases of sulfuric acid. The phase changing conditions had the most adverse effect on the materials.
Molar heat capacity measurement of CaHCl and CaHBr

S Shyam Kumar, Sajal Ghosh, Manjulata Sahu and Rajesh Ganesan

CaHCl and CaHBr are hydride ion conducting solid electrolytes find application in electrochemical hydrogen meter to determine dissolved hydrogen concentration in liquid sodium. Heat capacity of CaHCl and CaHBr were measured using DSC and reported.