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Editorial

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Editorial

Jaroslaw Drelich
Department of Materials Science and Engineering, Michigan Technological University, Houghton, MI, USA

Ludmila Boinovich
A.N. Frumkin Institute of Physical Chemistry and Electrochemistry, Russian Academy of Sciences, Russia

Ziqi Sun
Queensland University of Technology, Brisbane, Australia

The second issue of 2022 opens with a review of the current state-of-the-art in fabrication and application of superhydrophobic surfaces.[1] Although no longer as fashionable as it was a few years ago, the subject of superhydrophobic surfaces and coatings is still a popular research theme in many research laboratories around the World. In this review, Wang *et al.* provide a broad review of experimental techniques for manufacturing of superhydrophobic surfaces and structures through template replication, lithography, chemical etching, laser processing, electrospinning, electrochemical administering, and other methods. The authors also demonstrate miscellaneous opportunities in exploitation of functionality of fabricated superhydrophobic surfaces and structures with intent to foster anti-icing, self-cleaning, corrosion resistance, drag reduction, oil–water separation, and many other processes. The focus on surfaces made of micro- and nano-sized topographic surface features and green fabrication of such surfaces makes this review unique and attractive to many readers.

In the first contribution under the original research category, Cao *et al.*[2] reveal their technological invention on conductive functional finishing of textiles, a research area of smart textiles that is highly explored in recent years. The authors demonstrate a preparation of conductive polyester textile via printing of graphene oxide particles. The conductive polyester fabrics are constructed by printing graphene oxide paste and then converting graphene oxide to reduced graphene oxide by hot-pressing. Such an interesting polyester fabric with reduced graphene oxide can be used in intelligent wearable clothing and devices of high electrical conductivity and mechanical flexibility.

In the second original research contribution, Xiao *et al.*[3] propose the use of aluminum fluoride (AlF_3) coatings to optimize electrochemical performance of lithium (Li)-rich cathodes, which are known for their high specific capacity and energy density. The authors prepared rod-shaped AlF_3-coatings on a Li-rich cathode through a facile hydrothermal technique, followed by chemical coprecipitation processing. The invented cathode was characterized in detail regarding its chemical structure, micromorphology and electrochemical properties. It is demonstrated that the AlF_3 protective layer can provide an elastic buffer interspace to ameliorate the structure stability and expedite the Li^+ diffusion dynamics to enhance the electrochemical performance of the cathode material for Li-ion batteries.

In the next research contribution, Praveen *et al.*[4] demonstrate the alteration of hydrophilic surfaces of natural lignocellulosic coir fibers to hydrophobic surfaces using a spray–dry–cure method. In this invention, the surfaces of natural fibers are first cleaned with oxygen plasma before a fluoroalkyl-functional siloxane-based sol–gel coating is applied. The sol–gel-coated fibers exhibit excellent water and moisture repellence and improved mechanical strength, making them attractive filler material for biocomposites and environmentally friendly natural material for structures designed for collecting spilled oil from ground and water streams.

Further, Cetiner *et al.*[5] describe a modification of medical-grade stainless steel with an antibacterial implant material coating having enhanced bioactivity and wear resistance. A cold spray method was used to deposit a mixture of titanium, aluminum and silver, and then a thermal oxidation process was applied to oxidize titanium to a silver-incorporated titanium dioxide layer. The coating is capable of releasing silver ions and showed antibacterial activity against *Staphylococcus aureus*. Nucleation and growth of apatite-type structures were not affected by the presence of metallic silver in the titanium dioxide-based coating. Results of the simulated body fluid immersion tests indicate on superior bioactivity of the coating as compared to uncoated stainless steel, making it an attractive invention for orthopedic implants.

In the final contribution to this issue, Krishnan and Balakkrishnan[6] describe nanocomposite polymer blend (NCPB) electrolytes that were formulated using poly(ethylene oxide) and poly(vinylidene fluoride-co-hexafluoro propylene) as polymers, lithium triflate ($LiCF_3SO_3$) as an electrolyte, and nano-titania (TiO_2) as a filler. The electrical, structural, dielectric, luminescent, morphological and thermal properties of the NCPB electrolytes prepared by a conventional stirring approach were compared to those prepared using an ultrasonic irradiation method. It is shown that ultrasonic irradiation promotes the structural modification of NCPB electrolytes and increases their ionic conductivity. These new electrolytes meet the benchmark values for application in energy-storage devices.

We hope that you will find the content of this issue interesting and useful to your research projects. Please do not hesitate to email your comments and suggestions to us.

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