



Tunable neuronal scaffold biomaterials through plasmonic photo-patterning of aerogels

Martina Rodriguez Sala, Chenhui Peng, Omar Skalli, Firouzeh Sabri

New materials and biomaterials relevant to devices and instrumentation for the study of cells and tissue growth are always of high interest. In particular, aerogel and porous structures have the ability to improve bioadhesion and scaffolding. The authors highlight the use of plasmonic photo-patterning to enable precise integration.

doi.org/10.1557/mrc.2019.143

Three-dimensional-printed molds and materials for injection molding and rapid tooling applications

John Ryan C. Dizon, Arnaldo D. Valino, Lucio R. Souza, Alejandro H. Espera, Qiyi Chen, Rigoberto C. Advincula

The authors highlight a route toward using 3D printing of polymers for the fabrication of molds and rapid tooling and design for injection molding. Growing interest in additive manufacturing means an increase in the requirements for new polymers and the ability to meet the demands of thermally induced fabrication processes.

doi.org/10.1557/mrc.2019.147

Flexible, stretchable, conformal electronics and smart textiles: Environmental life-cycle considerations for emerging applications

Karsten Schischke, Nils F. Nissen, Martin Schneider-Ramelow

The high interest on conformable and flexible electronics for a variety of sensor and design applications fit for the human body is producing a demand for new materials. The authors emphasize the environmental implications for new materials choices. There is a good development and identification of factors that can make this successful for eventual manufacturing.

doi.org/10.1557/mrc.2019.157

Interfacial study on the functionalization of continuously exfoliated graphite in a PA66 using high shear elongational flow

Justin W. Hendrix, Thomas Nosker, Jennifer Lynch-Branzoi, Thomas Emge

The authors present a method to exfoliate graphite to multilayer graphene within a polymer, creating functionalized graphene-reinforced composites in a novel single-stage process. The strength and stiffness of the composite significantly exceed the matrix, and microscopy and chemical characterization are used to explain the effectiveness of the process.

doi.org/10.1557/adv.2019.454

In vitro degradation analysis of 3D-architected gelatin-based hydrogels

Jun Hon Pang, Christian Wischke, Andreas Lendlein

The mechanisms related to the mechanical performance degradation of bio-based hydrogels are evaluated. Oxidation and interaction with collagenase I are particularly effective at decreasing storage and loss modulus in a controlled manner while producing byproducts that have low toxicity, making these materials candidates for tissue compatible repair.

doi.org/10.1557/adv.2019.441

Novel hierarchical $\text{YBO}_3:\text{Eu}^{3+}$ nanocrystals synthesized by folic-acid-assisted hydrothermal process

Xianj. Xing, Shan Li, Yuq. Song, Yingz. Ge, Xuef. Zhang, Wen Jiang, Xianwen. Zhang

A simple hydrothermal processing method to create photoluminescence crystals with novel "flower-like" surface morphologies is presented. Both the structure and the optical response of these materials are presented, resulting in a possible method to create low-cost phosphors using a process with low environmental impact.

doi.org/10.1557/adv.2019.455