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Editorial

Micro/Nanofabrication and Characterization of Advanced Materials and Devices

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The controllable fabrication of materials/devices in micro- and nanoscale, which is supported by advanced characterization, is the key for nanotechnology revolution. Compared to decades ago when the so-called nanotechnology was restricted to the literature, we have made it a reality. Some specific fields, silicon chips fabrication for example, have touched the nanoeffect and are working on avoiding the quantum effects. In another hotspot field, energy storage and conversion, we have seen the dawn of nanomaterials. The energy storage capability and conversion efficiency increased by folds upon nanosizing the materials. The uncontrollable side reactions in chemistry, however, are still a challenge in looking for better batteries, supercapacitors, and catalysts. Thus, rational and controllable fabrication of nanomaterials is needed. In this special issue, we can find some recent updates in nanotechnology.

Bacterial adhesion on medical devices leads to severe infections, which trouble people a lot. A group from Colombia has developed a superficial modification technique to decrease bacterial adhesion on steel 316L by one fold. Importantly, this magic bacterial adhesion thin film can also be transferred to other substrates. The scientists from The University of Manchester created a methodology for scalable fabrication of TiO_2 nanotubes on Ti and Ti alloys. The diameters of the TiO_2 nanotubes are controllable from 25 to 100 nm. It is worth emphasizing that a 7.5 times lower cost is achieved by using the new methodology above. Another development in nanotubes is reported by a Malaysian research group. They functionalized the carbon nanotubes and used them to detect benzene contents in the atmosphere. Benzene, as a carcinogenic chemical, has been widely used in plastics and other polymer products. These carbon nanotube chemical sensors would be meaningful in monitoring benzene contents in workplaces of Malaysia and other Southeast Asian countries. The last two papers were contributed from China, Iran, and Iraq. Bing Han et al. optimized supercapacitors by modulating the pore structure of carbon flakes. A high capacitance and superior rate performance are achieved in lamellar activated carbons. It is worth noting that there is only 0.4% capacitance decay in these supercapacitors even after 2000 long cycles.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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