

Portable Polyelectrolyte Brush-Coated Sponge Composites for Environmental Remediation

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Abstract

Due to advancement of industrial development, heavy metal ions in waste water are daily flowing into ground surface and water resources. Cases of serious side effects have been reported since they are accumulated in the human body along the food chain. Because of effectiveness of adsorption process, numerous adsorbents have been proposed for efficient removal of heavy metal ions or organic pollutants in waste water. However, previously reported adsorbents and adsorption process are not suitable for small scale enterprise and individual user. Development of a portable heavy metal ion remover which can be used even by untrained user is highly demanded. Sponge is portable, easy to use, and ubiquitous materials. Polymer brushes possess advantages of numerous reaction sites and pH-responsive behaviors for control of adsorption/desorption. Thus, highly porous sponge composites decorated with polymer brushes via “grafting-from” or “grafting-to” polymerization was developed for fast and efficient removal of heavy metal ions in waste water or drinkable water.

References

- [1] Aleeza Farrukh, Attia Akram, Abdul Ghaffar, Sara Hanif, Almas Hamid, Hatice Duran, and Basit Yameen, Design of Polymer-Brush-Grafted Magnetic Nanoparticles for Highly Efficient Water Remediation, ACS Appl. Mater. Interfaces 2013, 5, 3784–3793.
- [2] Yongfang Yang, Yulei Xie, Lichuan Pang, Mao Li, Xiaohui Song, Jianguo Wen, and Hanying Zhao, Preparation of Reduced Graphene Oxide/Poly(acrylamide) Nanocomposite and Its Adsorption of Pb(II) and Methylene Blue, Langmuir 2013, 29, 10727–10736.