

Accepted Manuscript

Title: Preparation, tribological properties and biocompatibility of fluorinated graphene/ultrahigh molecular weight polyethylene composite materials

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PII: S0169-4332(16)30269-0
DOI: <http://dx.doi.org/doi:10.1016/j.apsusc.2016.02.100>
Reference: APSUSC 32618

To appear in: *APSUSC*

Received date: 5-11-2015
Revised date: 5-2-2016
Accepted date: 8-2-2016

Please cite this article as: L. Xu, Y. Zheng, Z. Yan, W. Zhang, J. Shi, F. Zhou, X.Z. </sup>, J. Wang, J. Zhang, B. Liu, Preparation, tribological properties and biocompatibility of fluorinated graphene/ultrahigh molecular weight polyethylene composite materials, *Applied Surface Science* (2016), <http://dx.doi.org/10.1016/j.apsusc.2016.02.100>

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Preparation, tribological properties and biocompatibility of fluorinated graphene/ultrahigh molecular weight polyethylene composite materials

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Abstract: Fluorinated graphene (FG)/ultra-high molecular weight polyethylene (UHMWPE) composites were successfully prepared by ultrasonic dispersion and liquid thermoforming method. The mechanical and tribological properties of pure UHMWPE and FG/UHMWPE composites were investigated using micro-hardness tester and high-speed reciprocating friction tester. The results showed that: adding FG could not only increase the micro-hardness of the composites, but also decrease the wear volume of the composite significantly. The friction coefficients of the composites were also reduced with the increasing of FG content. In addition, the MC3T3-E1 cells adhered and grew well on the surface of the FG/UHMWPE composites as observed by SEM and fluorescence microscope, indicating the addition of FG did not affect the morphology and activity of the cells. The FG/UHMWPE composites exhibited

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