
Nome da Disciplina: TOP042 - Materiais Grafênicos: propriedades e manipulação química

Área de Concentração: CTMA(X) CTMI() CTRA()

Nível: M/D

Obrigatória:

Optativa: X

Carga Horária: 30 horas

Número de Créditos: 02

Professor (es) : Clascidia Aparecida Furtado e Estefânia M. N. Martins

EMENTA

Neste semestre, a disciplina pretende focalizar o estudo de grafenos obtidos por esfoliação do grafite natural em líquidos (mecanismos de obtenção, características dos grafenos obtidos e interações com diferentes meios).

Programa

- Introdução aos materiais grafênicos;
- Propriedades;
- Esfoliação química do grafite em grafenos;
- Manipulação química pós-obtenção de grafenos: reatividade química, purificação, funcionalização, dispersão;
- Interações grafeno-meio (solvente, macromoléculas, biomoléculas e a interface Nano- Bio)

Avaliação

Discussões, seminários e estudos dirigidos

Bibliografia básica

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- S. Reich, C. Thomsen, J. Maultzsch, “Carbon Nanotubes – Basic Concepts and Physical Properties”, Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim, 2004.
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- V. A. Basiuk, E. V. Basiuk (Ed.), “Chemistry of Carbon Nanotubes – vols. 1-3”, American Scientific Publishers, Stevenson Ranch, 2008.
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- Martin, N (ed); Nierengarten, J.F (ed). Supramolecular Chemistry of Fullerenes and Carbon Nanotubes. 1 ed. Weinheim: Wiley VCH, 2012. 418 p.
- Backes, C. Noncovalent Functionalization of Carbon Nanotubes: Fundamental Aspects of Dispersion and Separation in Water. Springer Theses. Erlangen-Nürnberg : Springer, 2012. 203 p.
- Katsnelson, M. Graphene: carbon in two dimensions. Cambridge : Cambridge University, 2012. 351 p.
- Warner, J. H et al. Graphene: fundamentals and emergent applications . Amsterdam: Elsevier, 2013. 450 p.
- Pati, S. K (ed.); Enoki, T (ed.); Rao, C. N. R (ed.). Graphene and its fascinating attributes. New Jersey : Word Scientific, 2011. 270 p.
- Rao, C. N. R (ed); Sood, A. K (ed). Graphene: synthesis, properties and phenomena. Weinheim: Wiley VCH, 2013. 416 p.
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- Morris, J. E (ed.); Iniewski, K (ed.). Graphene, carbon nanotubes and nanostructures: techniques and applications. Boca Raton : CRC Pr, 2013. 350 p.
- D'Souza, F (ed); Kadish, K. M (ed). Handbook of Carbon Nano Materials (In 2 Volumes) (World Scientific Series on Carbon Nanoscience). 1 ed. New Jersey: World Scientific Publishing Company, 2012. 824 p.
- Mertens, R. The Graphene Handbook. Herzelia: lulu.com , 2013. 112 p.
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- Alwarappan, S.; Kumar, A. Graphene-Based Materials: Science and Technology. Boca Raton: CRC Press, 2013. 224 p.
- Selbach, E. P. The millionaire investor: better than gold, diamonds or real-estate: graphene. S. L: ESAM, 2012. 177 p.
- Nel, A. E et al. Understanding biophysicochemical interactions at the nano–bio interface, Nature Materials (2009); 8(543-557) DOI: 10.1038/nmat2442
- Neha B. Shah and John C. Bischof. Blood protein and blood cell interactions with gold nanoparticles: the need for in vivo studies, BioNanoMat (2013); 14(1-2): 65–79 DOI 10.1515/bnm2012-0003
- Navya and Daima. Rational engineering of physicochemical properties of nanomaterials for biomedical applications with nanotoxicological perspectives, Nano Convergence (2016) 3:1 DOI 10.1186/s40580-016- 0064-z
- E.M. do Nascimento Martins; FURTADO, C. A. ; A. P. Santos ; L. M. de Andrade ; L.O. Luiz . Synthesis, Purification and Functionalization of Carbon Nanotubes for Biotechnological Applications. Synthesis, Purification and Functionalization of Carbon Nanotubes for Biotechnological Applications. 1ed.Switzerland: Springer, 2016, v. , p. 139- 163