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## Multiphasic nanostructured materials based on block copolymers

Block copolymers can self-assemble to form nanoscale structures with domain spacing that depends on molecular weight, segment size, and the strength of the interaction between the blocks, represented by the Flory-Huggins interaction parameter, χ. In selective solvents, diblock copolymers are able to form micelles of various morphologies such as spheres, cylinders, vesicles, etc. In the bulk, microphase separation occurs, leading to various microstructures such as spheres, hexagonally packed cylinders, lamellae, and discontinuous phases. The ability to control both the length scale and the spatial organization of block copolymer morphologies makes these materials particularly attractive candidates for use as templates in the preparation of multiphasic nanostructured materials based block copolymers, which can act as templates for advanced hybrid inorganic/organic materials. Different examples of hybrid inorganic/organic materials based on block copolymers and nanostructured thermosetting systems will be presented at the conference. Atomic force microscopy will be mainly used to investigated the morphology and also electrical (electrostatic force microscopy (EFM), tunneling force microscopy (TUNA)) properties of designed multiphasic materials. Moreover, biohybrid inorganic/organic materials based on the bacterial cellulose modified with vanadium and titanium nanoparticles synthesized by sol-gel process will be discussed; also, bacterial cellulose modified with block copolymer will be focused upon.

### Recent Publications

1. Carrasco-Hernandez S, Gutierrez J and Tercjak A (2017) Optical reversible behavior of poly(ethylene-b-ethylene oxide) block copolymer dispersed liquid crystal blends. Eur Polym J. 91:187–196.
2. Gutierrez J, Carrasco-Hernandez S and Tercjak A (2016) Transparent nanostructured cellulose acetate films based on the self-assembly of PEO-b-PPO-b-PEO block copolymer. Carbohyd Polym 165:437–443.
3. Cano L, Di Mauro A E, Striccoli M, Curri M L and Tercjak A (2015) Optical and conductive properties of as-synthesized organic-capped TiO2 nanorods highly dispersible in polystyrene-block-poly(methyl methacrylate) diblock copolymer. ACS Appl Mater Interfaces 6:11805–11814.
4. Gutierrez J, Tercjak A and Mondragon I (2010) Conductive behaviour of high TiO2 nanoparticles content of inorganic/organic nanostructured composites. J Am Chem Soc. 132: 873–878.
5. Tercjak A, Gutierrez J, Ocando O and Mondragon I (2010) Conductive properties of switchable photoluminescence thermosetting systems based on liquid crystals. Langmuir 26:4296–4302

### Biography

Agnieszka Tercjak is Senior Researcher at University of the Basque Country and Professor of Master's in Renewable Materials Engineering and in Advanced Materials Engineering. She possesses more than 110 scientific papers in peer-reviewed journals (78 in Q1, 35 in D1). She has given over 140 presentations at national and international meetings, about 65 of which are oral contributions. She actively participates in more than 30 peer-reviewed and funded research projects in the field of Materials Science and Nanotechnology, 10 of them with financial support of the National Plan I+D+I of Spanish Ministry of Economy, Industry and Competitiveness and three of them in frame of the international projects with financial support of European Community. She has supervised five PhD students and is currently the Supervisor of three PhD theses.

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