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Research topics

- Ionic composite hydrogels/cryogels based on natural and synthetic polymers: synthesis, characterization and investigation of sorption properties;
- Cationic composite hydrogels with applications in removal of azo dyes from wastewaters;
- Ionic organic/inorganic hybrids containing quaternary ammonium salt groups in the side chain, as sorbents for dye removal.

The structure/properties relationship of the ionic composite hydrogels/cryogels have been studied by Fourier-transform infrared (FTIR) spectroscopy, differential scanning calorimetry (DSC), scanning electron microscopy (SEM) and the swelling capacity.

Scientific research

Author and co-author of 14 scientific papers (11 in ISI-ranked journals, 2 in BDI journals, 1 in open access journal), 3 full papers in scientific volumes, 42 presentations (2 lectures, 23 oral communications and 17 posters) and research team member in 3 national grants/project.

5 important publications

1. M. M. Perju, M. V. Dinu, E. S. Dragan
Sorption of Methylene Blue onto ionic composite hydrogels based on polyacrylamide and dextran sulfate: kinetics, isotherms, and thermodynamics
Separation Science and Technology 47 (2012) 1322-1333.
<https://doi.org/10.1080/01496395.2012.672515>
2. E. S. Dragan, M. M. Perju, M. V. Dinu
Preparation and characterization of IPN composite hydrogels based on polyacrylamide and chitosan and their interaction with ionic dyes
Carbohydrate Polymers 88 (2012) 270-281.
<https://doi.org/10.1016/j.carbpol.2011.12.002>
3. E. S. Dragan, M. M. Lazar, M. V. Dinu, F. Doroftei
Macroporous composite IPN hydrogels based on poly(acrylamide) and chitosan with tuned swelling and sorption of cationic dyes
Chemical Engineering Journal 204-205 (2012) 198-209.
<https://doi.org/10.1016/j.cej.2012.07.126>
4. M. M. Lazar, C. -D. Varganici, M. Cazacu, E. S. Dragan
Cationic hybrids from poly(N,N-dimethylaminoethyl methacrylate) covalently crosslinked with chloroalkyl silicone derivatives effective in binding anionic dyes
Journal of Applied Polymer Science 133 (2016) article number: 43942.
<https://doi.org/10.1002/app.43942>
5. M. V. Dinu, M. M. Lazar, E. S. Dragan
Dual ionic cross-linked alginate/clinoptilolite composite microbeads with improved stability and enhanced sorption properties for methylene blue
Reactive and Functional Polymers 116 (2017) 31-40.
<https://doi.org/10.1016/j.reactfunctpolym.2017.05.001>