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## Magnetic macroporous copolymer as oxyanions sorbent

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Magnetic macroporous copolymer of glycidyl methacrylate and ethylene glycol dimethacrylate, *m*-poly(GMA-co-EGDMA), synthesized by suspension copolymerization with silanized magnetite and functionalized with diethylene triamine, *m*-poly(GMA-co-EGDMA)-DETA, was evaluated as sorbent for oxyanions removal from aqueous solutions. Previous studies in the field show high affinity of this type of sorbent for molybdate and perrhenate as well as pertechnetate ions. Also, amino-functionalized macroporous poli(GMA-co-EGDMA) has high capacity and good selectivity for the precious and heavy metal ions over alkali and alkaline earth metals. The sorption mechanism (chelation, electrostatic interactions or ion exchange) is dependent on pH, the speciation of metal ions as well as on the degree of the protonation of amine groups. In this study, m-poli(GMA-co-EGDMA)-DETA was tested as sorbent of Mo(VI), Re(VII), V(V), Wo(VI), Cr(VI), As(V) and Se(VI) oxyanions from aqueous solutions in a batch static system, under competitive conditions in the temperature range 298–343 K. As a result, the selectivity of the magnetic sorbent declined in order: $(ReO_4)^-$ > $(VO_4)^{3-}$ >> $(WO_4)^{2-}$ > $(MoO_4)^{2-}$ ~ $(CrO_4)^{2-}$ ~ $(AsO_4)^{3-}$ > $(SeO_4)^{2-}$. The sorption capacity (Q in μg/g) for $(ReO_4)^-$ and $(VO_4)^{3-}$ was 3–4 times higher in relation to other oxyanions present in the solution. The sorption process was rapid, i.e. the half-sorption time, t1/2, was approximately 3 minutes and less). The thermodynamic parameters showed that sorption process was endothermic and spontaneous in nature, promoted with temperature rise (up to 343 K) and with increased randomness in the system.

Sorption capacity of magnetic copolymer m-poli(GMA-co-EGDMA)-DETA for different metal species, contact time 180 minute.

**Recent Publications:**

1. B M Marković, Z M Vuković, V V Spasojević, V B Kusigerski, V B Pavlović, et al. (2017) Selective magnetic GMA based potential sorbents for molybdenum and rhenium sorption. J. Alloys. Compd. 705:38–50.
2. B M Marković, D Lj Janković, A A Vukadinović, D V Ranđelović, D D Maksin, et al. (2017) A novel macroporous polymer–inorganic nanocomposite as a sorbent for pertechnetate ions, RSC Adv. 7:21412–21421.
3. L Malović, A Nastasović, Z Sandić, J Marković, D Đorđević, et al. (2007) Surface modification of macroporous glycidyl methacrylate based copolymers for selective sorption of heavy metals. Journal of Materials Science 42(10):3326–3337.
4. E Guibal, C Milot and J M Tobin (1998) Metal-Anion sorption by chitosan beads: equilibrium and kinetic studies. Ind. Eng. Chem. Res. 37:1454–1463.

### Biography

Ljiljana Surucic is a PhD student at the Faculty of Chemistry in Belgrade. Her primary area of interest is Polymer Chemistry, primarily the synthesis, characterization and their use in water pollution and biomedicine. Her MSc was a part of long lasting research on application of functional polymer sorbents for removal of heavy and transition metals from aqueous solution. Her current work is focused on the synthesis of magnetic polymers with desired final properties (spherical morphology, narrow particle size distribution (PSD), high thermal stability) as well as modification of the surface chemistry by introducing various functional groups. She is a Member of the Serbian Chemical Society and works as an Associate at the Medical Faculty at University of Banja Luka.

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