



Vali-e-Asr University  
of Rafsanzan



19<sup>th</sup> Iranian Seminar on Organic Chemistry  
Vali-e-Asr University of Rafsanzan, 5 -7 Sep. 2012



## Synthesis and application of Pb(II)-imprinted chitosan as biodegradable adsorbent for selective adsorption of Pb(II) from waste water

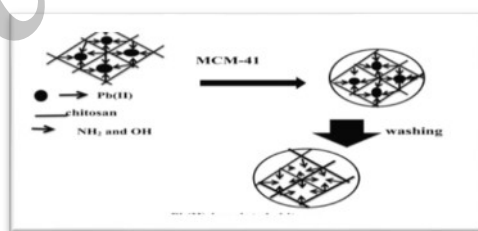
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Solid-phase extraction (SPE) is one of the most used techniques for separation of selected analytes due to its flexibility, environmental friendly, and simplicity. However, the basic disadvantage of traditional SPE adsorbents is lack of selectivity for metal ions which leads to the interference of other species for the determination of the target metal ions. Recently, it was extensively reported that the selectivity of SPE can be enhanced by using molecularly imprinted polymer (MIP), which have synthetic recognition sites with high selectivity and affinity for the template. Ion imprinting polymer (IIP) is similar to MIP, but they recognize metalions [1]. The synthesis process can be explained generally as follows: (1) template molecules(ion) graft on functional monomer until reaching saturation; (2) post-imprinting of template molecules is conducted towards the grafted polymers using cross-linking agent; (3) the polymer grafts on the surface of matrix material and forms a thin polymer layer [2]. In this study Cross-linked Pb(II)-imprinted chitosan were prepared from chitosan. which can be used for selective adsorption of Pb(II) at solid-phase extraction. using Pb(II) as tamplate, KH-560 (3-(2,3-epoxy propoxy)propyltrimethoxysilane) as coupling and cross linker agent and MCM-41 as substrate. the Pb(II) imprinted chitosan were characterized by Fourier infrared spectroscopy, X-ray diffraction and TG/DTG technique. the result showed that the adsorption of Pb(II)-imprinted chitosan affected by the initial PH, the initial concentration, contact time and amount of sorbent, as well as temperature. the optimal condition were recognized as; pH=5, contact time of 60min , initial concentration of Pb(II) as 250mg/l and adsorbent dose as 0.1g. data showed the maximum adsorption capacity of the Pb(II)-imprinted polymer and non-imprinted one, was respectively 44.8 and 27 mgg<sup>-1</sup>.



### References:

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[2] F. Bonini, S. Piletsky, A.P.F. Turner, A. Speghini, A. Bossi, 22 (2007) 2322–2328.