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Synthesis and application of chelating resin based on poly (styrene-alt-maleic anhydride)(SMA) for metal ions removal

Mehdi Hosseinzadeh,[1,*] Farideh Mahmoodzadeh,[2]

[1]*Marand Faculty of Technical and Engineering, University of Tabriz, Tabriz, Iran*

[2]*Halal Research Center of IRI, FDA, Tehran, Iran*

[*]Correspondence e-mail: *mh_1268@yahoo.com*

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With the advent of new technologies and rapid development of the global industry, heavy metal ions are increasingly discharged into the environment. They are causing damages to the environment, human and plants life.[1] Various techniques have been used to remove metal ions from aqueous solution. Among related techniques, adsorption is considered to be the most promising process.[2] Recently, the synthesis of graft copolymers with synthetic and natural polymers of maleic anhydride copolymers which can chemically bind metal ions from aqueous solutions have been reported.[3] The aim of the present work is to study the adsorption characteristics of the prepared chelating resin toward metal ions under different experimental conditions. For this propose, first SMA copolymer was synthesized by free radical polymerization and prepared linear copolymer was modified with 3-(4-hydroxy phenyl) cyclopropane-1,1,2,2-tetracarboxylic acid (HPC) as a grafting and 1,2 diamino ethane as a crosslinking agent to obtain new chelating copolymer with multi-carboxylic acid cyclo propane functionalities in the pendant group. The functionalized copolymer showed strong adsorption ability to the Cu (II), with the maximum adsorption capacities at pH, 5. The high adsorption rate (<30 min) was seen. The synthesized resin and its metal ions chelates were characterized by FT-IR, thermogravimetric analysis (TGA) and atomic absorption techniques (AAS).

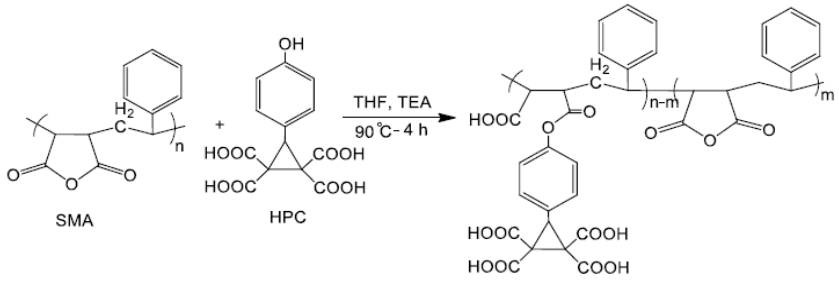

Fig. 1 Synthesis route of SMA-HPC

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