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Macromolecule flocculants modified to trap heavy metals from water

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Flocculation is one of the most important methods of water treatment. The targets of flocculant's action are the hydrophobic colloids and suspended particles which consist of insoluble substances. In recent years, it was found that some macromolecule flocculants are able to trap soluble heavy metal ions in aqueous solution if some strong ligands for heavy metals are linked to their molecules by chemical bonds, thus the macromolecule flocculants with the function of trapping heavy metals have been prepared. It was reported before by our research group that we developed three methods for preparation of such macromolecule flocculants: (1) Polyethyleneimine-sodium xanthogenate (PEX) was prepared by grafting a xanthogenate group to polyethyleneimine under the alkaline condition; (2) Starch-graft-polyacrylamide-co-sodium xanthate (CSAX) was synthesized by grafting copolymerization reaction of corn starch, acrylamide (AM) and sodium xanthate using epichlorohydrin (EPI) as cross-linking reagent and ceric ammonium nitrate (CAN) as initiator and (3) Mercaptoacetyl chitosan (MAC) was prepared by reacting chitosan with mercaptoacetic acid in the presence of 1-ethyl-3-3 (dimethylamino-propyl) carbodiimide hydrochloride (EDC·HCl) as the activating agent. The experiments proved that this kind of flocculant has many remarkable advantages, for example, high removal efficiency, fast sedimentation velocity, good separation effect, and more applicability to the treatment of the water which contains both turbidity and heavy metals, showing good prospect of both research and usage. This research increased the kinds of target of flocculant's action and extended the research area of flocculation in water treatment.

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