

Abstract

This diploma thesis is focused on coagulation of humic substances (HS) and BSA (Bovine Serum Albumin) protein which was chosen as a representative of proteins contained in AOM (Algal Organic Matter). Additionally, possible interactions between these compounds were also investigated. It was found that the optimal dosage of coagulant is much higher for HS compared to BSA. The best removal of both HS and BSA was reached in slightly acidic pH range and it is attributed mainly to charge neutralization and adsorption mechanisms. The maximum removal rate was 70 % for humic substances and 80 % for BSA. The results show that BSA has a positive effect on coagulation of HS (resulting in a lower coagulant demand) and vice versa while BSA was removed more efficiently than HS. The existence of interactions between BSA and humic substances during coagulation was demonstrated in certain pH ranges and it can occur even without the presence of coagulant. These interactions are highly dependent on pH that determines charge properties (and hence reactivity) of organic matters. Finally, the comparison of BSA and cyanobacterial proteins shows that their behavior during coagulation is similar. Consequently, BSA can be used as a model compound representing AOM proteins, especially their high molecular weight fraction.

Keywords

BSA (Bovine Serum Albumin); humic substances; NOM (Natural Organic Matter) interactions; coagulation; cyanobacterial proteins.