Effects Of Hydrophobe Contents Of Amphiphilic Polyelectrolytes On Flocs
Size And Removal Efficiency Of NOM From Waters

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Summary

Polymer-based coagulants, such as amphiphilic polyelectrolytes, are used for water treatment in two distinct ways, as coagulant aids and as primary coagulants. In the latter role, polymers have a number of advantages over inorganic coagulants, notably the smaller volume of sludge produced and reduced sludge management costs. This study examines the impact of molecular structure of novel amphiphilic polyelectrolytes on floc size and size distribution determined by dynamic light scattering. These parameters are related to hydrophobe contents and charge of the polyelectrolyte. These characteristics are also related to the removal efficiency of natural organic matter (NOM). It is expected that a much lower amount of polymer is sufficient when amphiphilic polyelectrolytes are used as primary coagulants/flocculants in treating waters contaminated with NOM. The smaller polymer amount may result in lesser treatment costs as well as yielding a much lower sludge volume. Dynamic light scattering and UV absorbance results confirmed an optimum polymer dose of 0.3ppm with up to 5% hydrophobe contents. The polymer hydrophobe contents were directly related to the system performance and NOM removal efficiency. The pH of the solution was virtually unaffected.

References:
1. 1998, USERS MANAULA WYATT
2. ANDERSEN NPR, 2001, J CHIN INST CHEM ENG, V32, P525
3. BABCOCK DB, 1979, J AM WATER WORKS ASS, V71, P149
4. BELLAR TA, 1974, J AM WATER, V66, P703

http://www.kfupm.edu.sa
5. BOLTO B, 2001, WATER RES, V35, P2669
6. BUFFLE J, 1990, ANAL CHIM ACTA, V232, P1
7. CHRISTMAN RF, 1983, ENVIRON SCI TECHNOL, V17, P625
9. COLLINS MR, 1986, ENVIRON SCI TECHNOL, V20, P1028
11. EDZWALD JK, 1985, J AM WATER WORKS ASS, V77, P122
12. GLASER HT, 1979, ENVIRON SCI TECHNOL, V13, P299
13. HUSSEIN IA, 2005, EUR POLYM J, V41, P2472, DOI
14. 10.1016/j.europolymj.2005.04.023
15. JIAQIAN J, 2001, SEP PURIFIC METHODS, V30, P127
16. KAM SK, 2001, WATER RES, V35, P3557
17. KORSHIN GV, 1997, WATER RES, V31, P1787
18. KRASNER SW, 1989, J AM WATER WORKS ASS, V81, P41
20. 10.1016/j.europolymj.2005.04.024
21. NARKIS N, 1975, J AM WATER WORKS ASS, V67, P101
22. ROOK JJ, 1974, WATER TREAT EXAM, V23, P234
23. SEMMENS MJ, 1986, J AM WATER WORKS ASS, V78, P86
24. SINGER P, 1993, P AM WAT WORKS ASS W, P1
25. SINGER PC, 1994, J ENVIRON ENG-ASCE, V120, P727
26. SINGH BP, 1999, SEPAR SCI TECHNOL., V34, P743
27. STEVENS AA, 1976, J AWWA, V68, P615
28. THIRUVENKATACHARI R, 2002, DESALINATION, V147, P83
29. TRIPATHY SK, 2002, HDB POLYELECTROLYTES, V2
30. UEDA T, 1968, J APPL POLYM SCI, V12, P2383
31. YU J, 2003, WATER SCI TECHNOL, V47, P89

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