Contribution ID: **21** Type: **Poster Only**

Anti-Fouling and Charge-Tuning Surface Coatings Realized by N-oxide/Amine Polymer Brushes

N-oxides have been studied as a zwitterionic functional group with an extremely short dipole in the field of anti-fouling materials. In this work, we prepared polymer brushes containing N-oxides via SI-ATRP (surface initiated-atom transfer radical polymerization) and achieved brushes with controlled thickness for anti-fouling study. The achieved brushes were characterized on N-oxide content, salt and pH responsiveness, and biofouling resistance to proteins. In addition, we successfully demonstrated the reversible conversion between N-oxide brushes and tertiary amine brushes, enabling a controlled switch on surface properties, including surface charge, pH sensitivity and biofouling resistance. Overall, our work studied the N-oxide brush regarding synthesis strategy, brush stability, fouling resistance and controlled conversion with the tertiary amine brush, providing insights on surface coating with this novel anti-fouling zwitterion.

Topical Area

Soft matter: polymers, and complex fluids

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