

Heterogeneously Charged Complexes of Random Copolymers for the Segregation of Organic Molecules

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Scientific Achievement

A new technique was developed to segregate organic molecules from water and opens up new possibilities in the utilizing the disorder of random copolymers and polyelectrolyte complexes

Significance and Impact

This work illustrates the importance of nanoscale heterogeneity when considering the interactions of organic molecules with polyelectrolyte complexes.

These discoveries can potentially improve the water treatment process of flocculation by enabling it to remove a wide range of organic contaminants

Research Details

An amphiphilic anionic random copolymer was mixed with a cationic copolymer to form polyelectrolyte complexes in aqueous solution

Significant amounts of anionic, cationic, and hydrophobic dyes, as well as fluorinated surfactant were removed from solution

Molecular dynamics simulations were performed to probe nanoscale heterogeneity and understand complex formation and molecule interactions

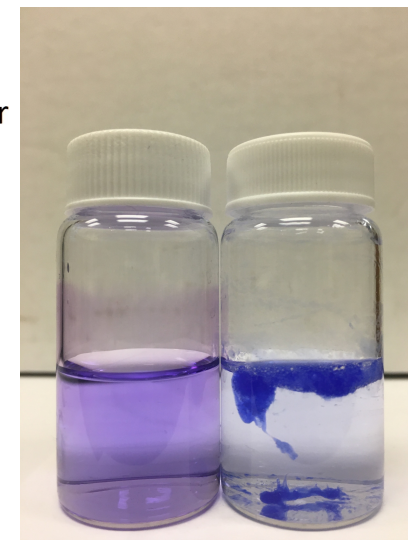
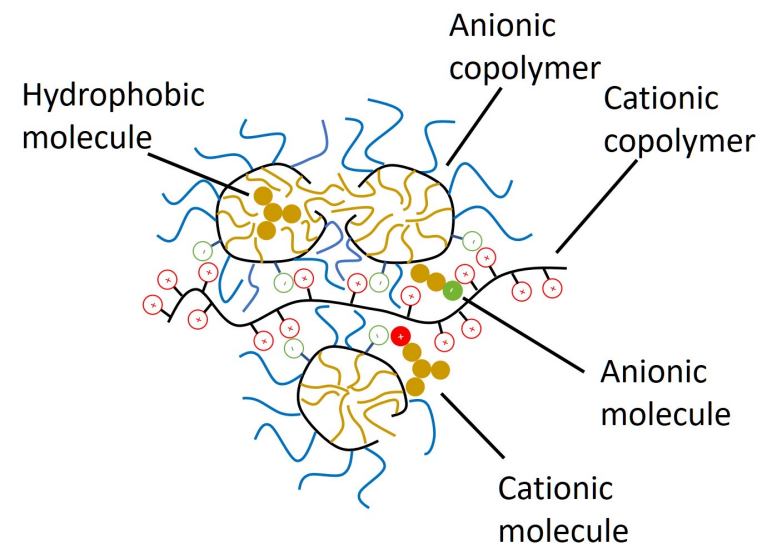


Figure 1. Illustration of polyelectrolyte complex and encapsulation of organic molecules (left). Image of solutions with dye and complexes that have encapsulated said dye (right).