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Comparison between the interactions of the cationic surfactant DODAB with xanthan and galactomannan

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ABSTRACT

The interactions of the cationic surfactant DODAB with anionic xanthan (XAN) and nonionic galactomannan (GMC) polysaccharides in solution were investigated using tensiometry, differential scanning microcalorimetry (μ -DSC), zeta potential and dynamic light scattering (DLS) techniques and by the calculated thermodynamic parameters of ΔG_{ves}^0 , ΔG_{ads}^0 , Γ_{max} and a_{min} . The surfactant formed large unilamellar vesicles (LUV) that aggregated with both polymers in solution. Increasing DODAB concentrations resulted in greater and greater DODAB-XAN aggregates, high turbidity and even precipitation, while DODAB-GMC aggregates remained equal sized, clear solution and no precipitation observed. Further addition of DODAB to XAN solution was able to resuspend the precipitates. The interactions with both polysaccharides resulted in a more spontaneous adsorption of the DODAB-polymer aggregates at the air/solution interface with lower surfactant population.

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