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Evolution and Behavior of Aqueous Foam Stabilized by Polycationic Amphiphilic Surfactants[1] SETH HEERSCHAP, James Madison University, KEVIN CARAN'S RESEARCH GROUP COLLABORATION — Aqueous foams are close packing of gas bubbles stabilized by surface active molecules. They exhibit rich topology and rheological behavior mostly attributed to their complex structure. In this project we study the impact of the molecular structure of the surfactants on foam stability. We compare the coarsening rate (bubble growth rate) of foam produced with five different amphilphilic surfactant molecules: Single headed, single tailed anionic and cationic surfactants (SDS, CTAB and DTAB) and triple cationic headed and double tailed surfactants (M-1,14,14 and M-P,14,14). In addition molecules with different hydrocarbon tail lengths (CTAB and DTAB) were tested and their rupture and coarsening rates were measured. Results show significant difference in coarsening and rupture rate between amphiphilic surfactants of different tail lengths. Differences due to surfactant head/tail structure appear to be much more subtle and inconclusive.

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