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Aqueous Foam Stabilized by Tricationic Amphiphilic Surfactants SETH HEERSCHAP, JOHN MARAFINO, KRISTIN MCKENNA, KEVIN CARAN, KLEBERT FEITOSA, James Madison University, KEVIN CARAN'S RESEARCH GROUP COLLABORATION — The unique surface properties of amphiphilic molecules have made them widely used in applications where foaming, emulsifying or coating processes are needed. The development of novel architectures with multi-cephalic/tailed molecules have enhanced their anti-bacterial activity in connection with tail length and the nature of the head group. Here we report on the foamability of two triple head double, tail cationic surfactants (M-1,14,14, M-P, 14,14) and a triple head single tail cationic surfactant (M-1,1,14) and compare them with commercially available single headed, single tailed anionic and cationic surfactants (SDS,CTAB and DTAB). The results show that bubble rupture rate decrease with the length of the carbon chain irrespective of head structure. The growth rate of bubbles with short tailed surfactants (SDS) and longer, single tailed tricationic surfactants (M-1,1,14) was shown to be twice as high as those with longer tailed surfactants (CTAB, M-P,14,14, M-1,14,14). This fact was related to the size variation of bubbles, where the foams made with short tail surfactants exhibited higher polydispersivity than those with short tails. This suggests that foams with tricationic amphiphilics are closed linked to their tail length and generally insensitive to their head structure.

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