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Interfacial behaviour of sugar-based surfactants at the solid-liquid interface in relation to their structure and solution behaviour

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Sugar-based surfactants offers an appealing and environmentally friendly alternative to traditional surfactants but can also offer new functionality in applications. The interfacial behaviour of sugar-based surfactants will be discussed in relation to their solution behaviour. Here, the adsorption behaviour of the α - and β -anomer of hexadecylmaltoside (α -C16G2 and β -C16G2) at the solid-liquid interface has been studied by means of ellipsometry and neutron reflectometry. Even this subtle difference in headgroup configuration affects the formed layer structure, where the adsorbed amount was higher for the β -anomer. This suggests that the β -anomer can be packed more efficiently. For both anomers the adsorbed layer structure on a hydrophobic surface cannot be assigned to a surfactant monolayer, reflecting the strong head group attractive interactions between these types of surfactants. Similar attractive intermolecular interactions also control the bulk solution behaviour where the two anomers form different types of aggregates, where the β -anomer form worm-like micelles, while the α -anomer form significantly shorter, more spherical micelles.

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