Supporting information

Fig. S1: Melting temperature ($T_m$) of 5 wt% C$_{12}$G$_1$ in different hydrocarbon oils.
Fig. S2: Effects of temperature on the reverse micellar structures of C\textsubscript{12}G\textsubscript{1} in cyclic and straight chain hydrocarbon oils as obtained by SAXS; (a) The normalized X-ray scattering intensities, \( I(q) \), of the 5 wt\% C\textsubscript{12}G\textsubscript{1}/cyclohexane system in absolute unit at different temperatures of 50, 60, and 70 °C and (b) the corresponding real-space functions, \( p(r) \), obtained by GIFT procedure. (c) and (d), and (e) and (f), respectively present those for the 5 wt\% C\textsubscript{12}G\textsubscript{1}/octane and the 5 wt\% C\textsubscript{12}G\textsubscript{1}/decane systems at 60 and 70 °C. The solid and broken lines in panel (a), (c), and (e) represent GIFT fit and the calculated form factor for \( n \) particles in unit volume, respectively. Arrows in panels (b), (d), and (f) highlight the maximum diameter, \( D_{\text{max}} \), of the micellar core and the broken line in panel f indicates the cross section diameter of the core.

Fig. S3: Comparison of the micellar structures for different size of hydrophilic headgroup. (a) The SAXS intensities \( I(q) \) of the 5 wt\% C\textsubscript{12}G\textsubscript{1}/octane and 5 wt\% C\textsubscript{12}G\textsubscript{2}/octane systems obtained in absolute unit at 60 °C and (b) the corresponding pair-distance distribution functions, \( p(r) \).