

Supporting Information for

**Self-Assembly Mechanism, Physicochemical Analyses and Application
Performance Investigations of Branched Alkyl Glycosides with Alcohol Ether
Carboxylic Acids of Varied Epoxide Numbers**

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1 Supporting data

Table S1. Parameters calculated from the surface tension of the compounding system

Mixed Systems	α_{IG}	pC_{20}	γ_{cmc} (mN m ⁻¹)	cmc/ C_{20}	A_{min} (nm ²)	Γ_{max} (μ mol m ⁻²)
IG/AEC-5H	0.0	4.77	29.35	0.0135	0.92	1.82
	0.2	4.87	28.36	0.0136	1.24	1.34
	0.4	4.83	28.18	0.0148	1.28	1.30
	0.5	4.80	27.96	0.0157	1.35	1.23
	0.6	4.79	27.38	0.0161	1.37	1.21
	0.8	4.78	27.05	0.0165	1.39	1.20
	1.0	3.84	33.50	0.1445	3.44	1.40
IG/AEC-7H	0.0	4.79	28.46	0.0161	0.94	1.78
	0.2	4.82	27.74	0.0149	1.24	1.35
	0.4	4.80	27.35	0.0156	1.26	1.32
	0.5	4.77	27.08	0.0168	1.29	1.29
	0.6	4.74	26.96	0.0182	1.36	1.22
	0.8	4.71	26.55	0.0195	1.39	1.20
	1.0	3.84	33.50	0.1445	3.44	1.40
IG/AEC-9H	0.0	4.91	27.38	0.0123	0.99	1.69
	0.2	4.73	27.10	0.0185	1.26	1.32
	0.4	4.71	26.89	0.0195	1.29	1.28
	0.5	4.59	26.58	0.0258	1.31	1.27
	0.6	4.50	26.39	0.0315	0.34	0.24
	0.8	4.44	26.23	0.0358	0.35	1.23
	1.0	3.84	33.5	0.1445	3.44	1.40

Table S2. Composition, interaction parameters and activity coefficients of the mixed system at the micelle and interface

Mixed Systems	α_{IG}	X_1^m	β^m	f_1^m	f_2^m	X_1^σ	β^σ	f_1^σ	f_2^σ
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IG/AEC-5H	0.2	0.4625	-12.498	0.021	0.069	0.486	-9.285	0.086	0.111
	0.4	0.4885	-9.767	0.055	0.097	0.586	-8.543	0.231	0.053
	0.5	0.5068	-9.599	0.085	0.085	0.568	-6.230	0.312	0.134
	0.6	0.5458	-7.785	0.156	0.098	0.597	-5.009	0.443	0.168
	0.8	0.5554	-6.801	0.233	0.123	0.602	-2.871	0.635	0.353
IG/AEC-7H	0.2	0.4664	-8.336	0.055	0.163	0.486	-8.885	0.096	0.122
	0.4	0.5156	-5.919	0.131	0.207	0.586	-7.948	0.255	0.065
	0.5	0.5387	-5.702	0.191	0.191	0.568	-5.701	0.345	0.159
	0.6	0.5857	-3.178	0.430	0.336	0.597	-4.419	0.487	0.207
	0.8	0.5899	-2.043	0.641	0.491	0.602	-2.275	0.697	0.438
IG/AEC-9H	0.2	0.4364	-7.595	0.059	0.235	0.386	-5.711	0.116	0.426
	0.4	0.4756	-4.845	0.165	0.334	0.386	-3.541	0.263	0.591
	0.5	0.5087	-4.689	0.297	0.297	0.468	-3.084	0.417	0.509
	0.6	0.5757	-3.548	0.448	0.309	0.497	-1.959	0.609	0.617
	0.8	0.6099	-2.112	0.669	0.456	0.482	-0.669	0.836	0.856

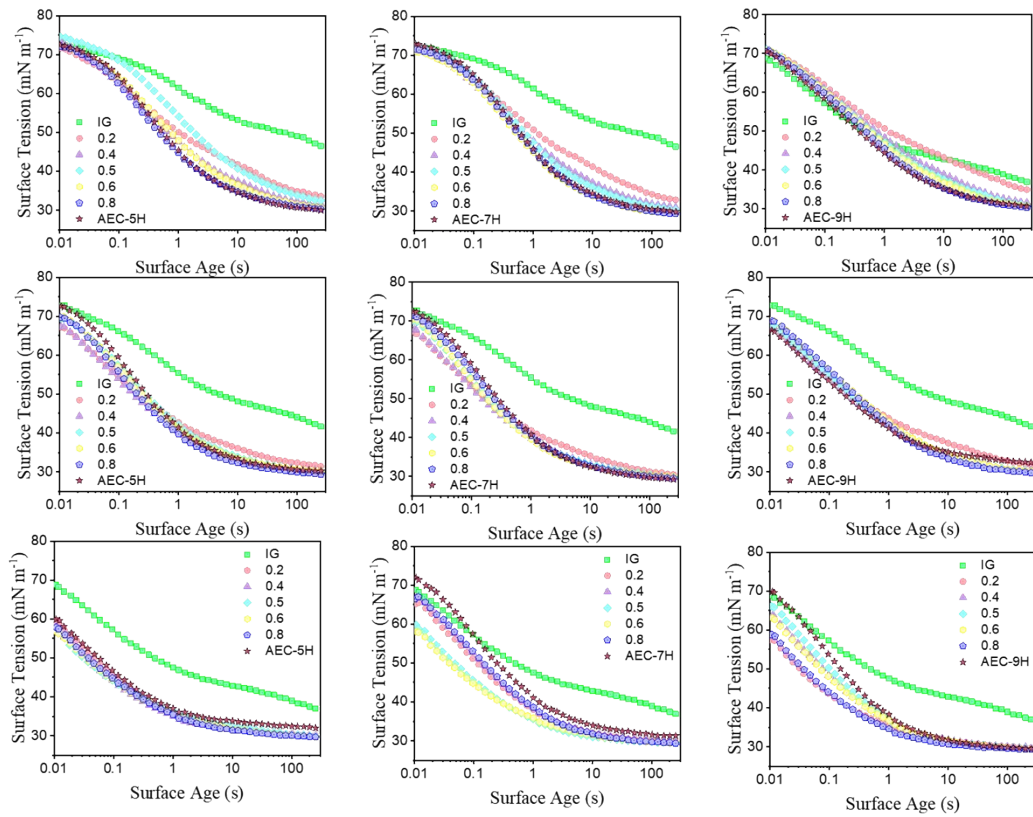


Fig. S1. Dynamic surface tension versus time with changes in α IG for (a) IG/AEC-5H mixed system, (b) IG/AEC-7H mixed system, and (c) IG/AEC-9H mixed system at 1×10^{-5} mol/l; (d) IG/AEC-5H mixed system at 1×10^{-4} mol/l, (e) IG/AEC-7H mixed system, (f) dynamic surface tension versus time for the IG/AEC-9H mixed system with α IG; (g) dynamic surface tension versus time for the IG/AEC-5H mixed system, (h) IG/AEC-7H mixed system, and (i) IG/AEC-9H mixed system with α IG at 1×10^{-3} mol/l.

Table S3. The droplet size and PDI of mixed system at different α IG

α_{IG}	IG/AEC-5H		IG/AEC-7H		IG/AEC-9H	
	Particle size (nm)	PDI	Particle size (nm)	PDI	Particle size (nm)	PDI
1	192.28	0.100	192.28	0.100	192.28	0.100
0.8	183.30	0.080	171.56	0.095	95.50	0.115
0.6	180.71	0.107	147.23	0.123	108.83	0.125
0.5	171.82	0.084	142.04	0.156	116.20	0.142
0.4	160.07	0.111	121.94	0.097	121.67	0.109
0.2	155.74	0.105	86.10	0.128	127.40	0.118
0	161.32	0.095	111.33	0.131	84.19	0.122

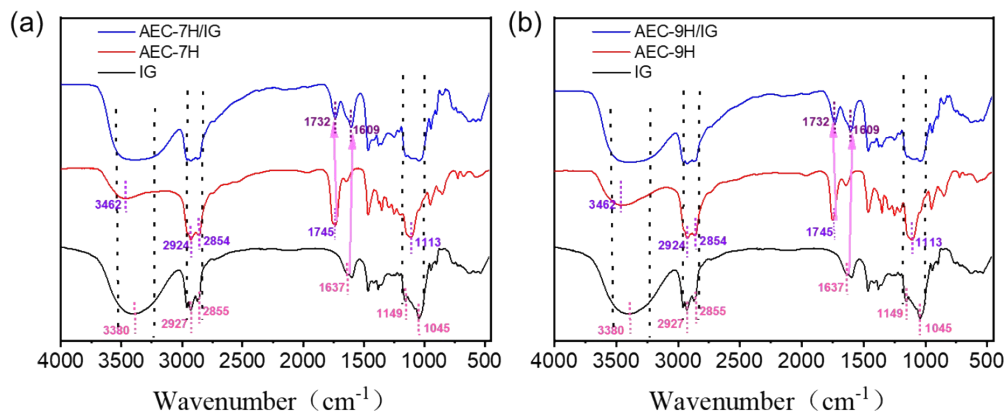


Fig. S2. (a) FTIR spectra of IG/AEC-7H hybrid system and IG, AEC-7H; (b) FTIR spectra of IG/AEC-9H hybrid system and IG, AEC-9H

Table S4. FTIR spectra data

Sample	cm ⁻¹	bonded groups	Sample	cm ⁻¹	bonded groups
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