SUPPORTING INFORMATION

Structure-rheology relationship in nanosheet-forming peptoid monolayers

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Table S1. Parameters obtained from the frequency dependent rheological data for the peptoid monolayers studied. The data for peptoids **2**, **5**, **7**, **8**, **11**, **17**, and **18** were globally fit to the Lucassen-van den Temple model to obtain the Gibbs elasticity (i.e. the limiting elasticity as the area oscillation frequency approaches infinity, E_0), the characteristic residence time of the peptoid within the monolayer (τ_D), and the monolayer viscosity (κ). For the monolayers composed of peptoids **1**, **9**, **10**, and **12**, the data were not fit because the residence times for the peptoids within the monolayers were longer than could be experimentally measured ($\tau_D \sim \infty$). Here, E_0 is given as the average E' value for all area oscillation frequencies measured.

Peptoid	E_0 **(mN/m)**	τ_D **(s)**	κ **(mNs/m)**
$(Nae\text{-}Npe)_7$-$(Nce\text{-}Npe)_7$ (**1**)	131 ± 5	∼∞	N/A
$(Nae\text{-}Npe)_3$-$(Nce\text{-}Npe)_3$ (**2**)	103.1 ± 0.6	44 ± 1	~ 0
$(Nae\text{-}Npe)_4$-$(Nce\text{-}Npe)_4$ (**5**)	123 ± 1	5000 ± 2000	0.6 ± 0.2
$(Nae\text{-}Neph)_4$-$(Nce\text{-}Neph)_4$ (**7**)	163 ± 3	0.40 ± 0.02	0.6 ± 0.2
$(Nae\text{-}N2mpe)_3$-$(Nce\text{-}N2mpe)_3$ (**8**)	156 ± 4	7.6 ± 0.9	0.2 ± 0.2
$(Nae\text{-}N3mpe)_3$-$(Nce\text{-}N3mpe)_3$ (**9**)	110 ± 7	∼∞	N/A
$(Nae\text{-}N4mpe)_3$-$(Nce\text{-}N4mpe)_3$ (**10**)	103 ± 5	∼∞	N/A
$(Nae\text{-}N25dmpe)_3$-$(Nce\text{-}N25dmpe)_3$ (**11**)	203 ± 4	400 ± 100	~0
$(Nae\text{-}N24dmpe)_3$-$(Nce\text{-}N24dmpe)_3$ (**12**)	130 ± 10	∼∞	N/A
$(Nce\text{-}Neph\text{-}Nce\text{-}Npe)_2$-$(Nae\text{-}Neph\text{-}Nae\text{-}Npe)_2$ (**17**)	172 ± 2	2.4 ± 0.1	1.9 ± 0.2
$(Nce\text{-}Npe)_4$-Nae-Neph-$(Nae\text{-}Npe)_3$ (**18**)	93 ± 1	28 ± 2	3.2 ± 2

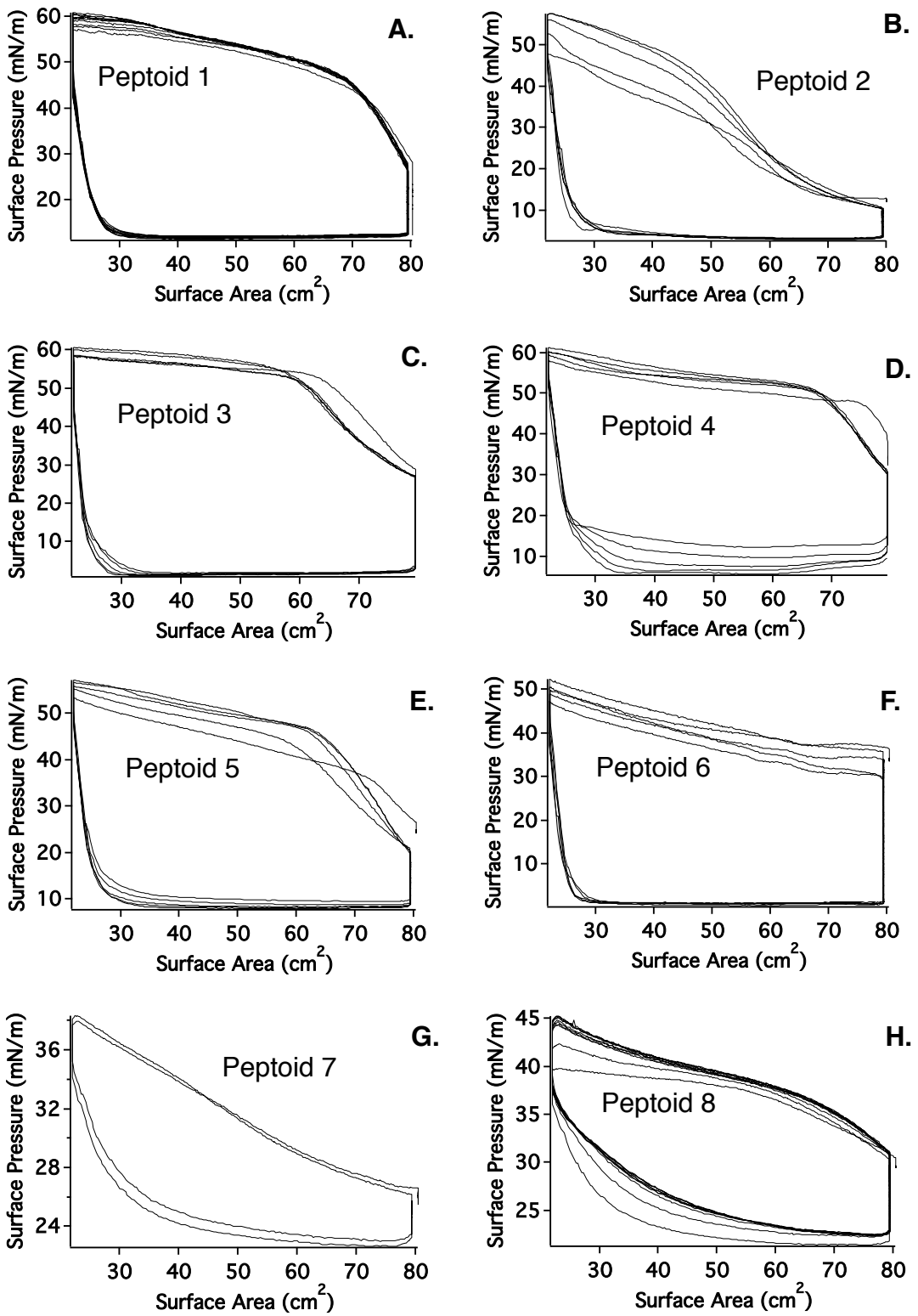

Figure S1. Surface pressure vs. area isotherms for the monolayers of peptoids **1**-**8** (A-H) after the first few compression-expansion cycles.

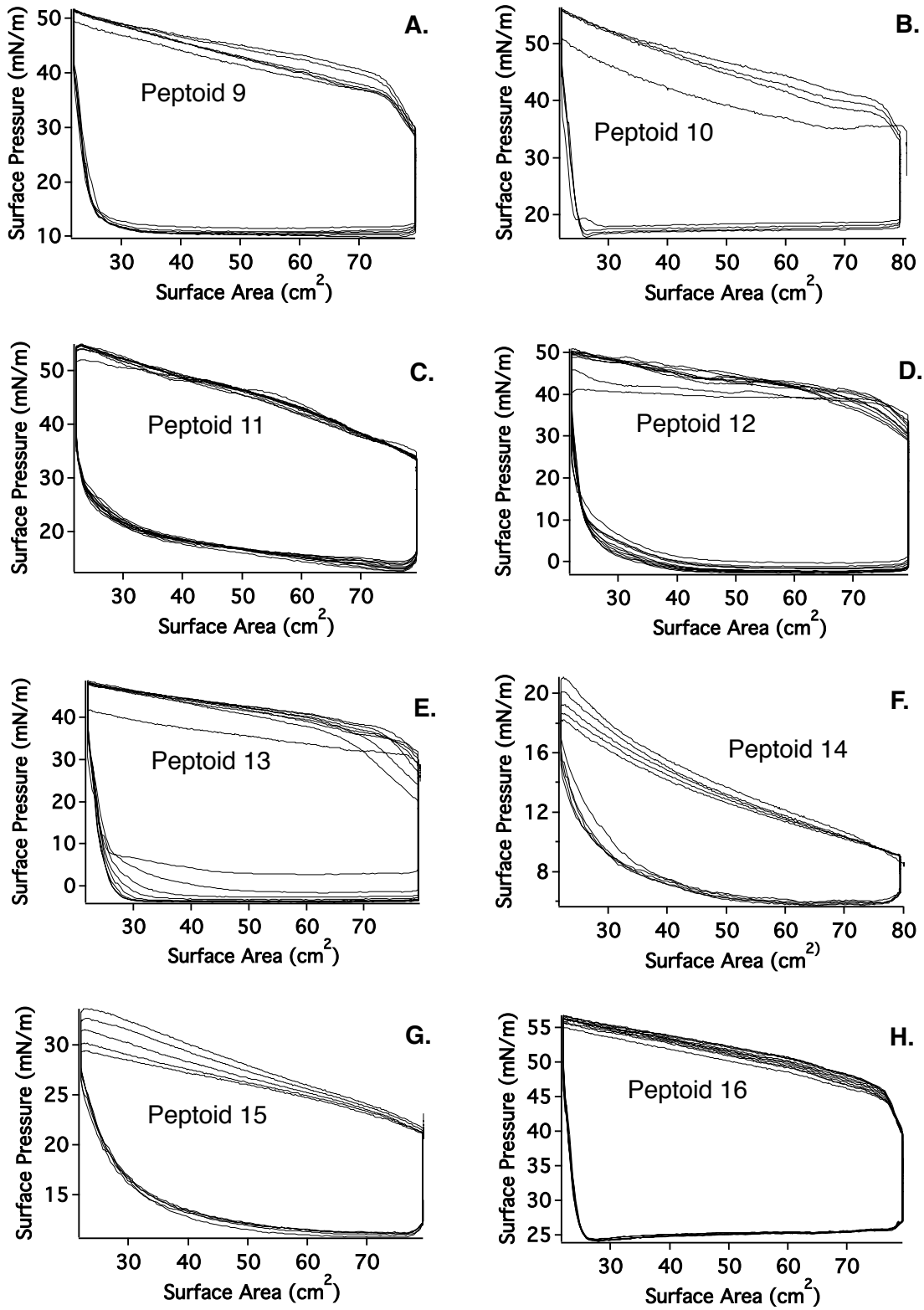

Figure S2. Surface pressure vs. area isotherms for the monolayers of peptoids **9-16** (A-H) after the first few compression-expansion cycles.

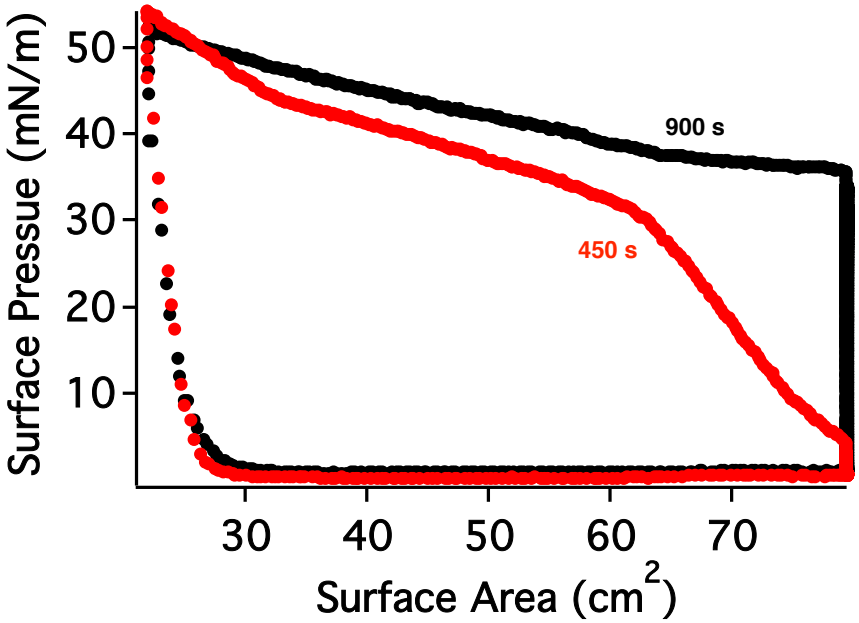

Figure S3. Surface pressure vs. area isotherms for monolayers of peptoid **6** at adsorption times of 900 s (black) and 450 s (red).