Supporting Information

Real-Time Investigation of Lung Surfactant Respreading with Surface Vibrational Spectroscopy

*Gang Ma and Heather C. Allen**

Department of Chemistry, The Ohio State University, 100 West 18th Avenue, Columbus, Ohio 43210

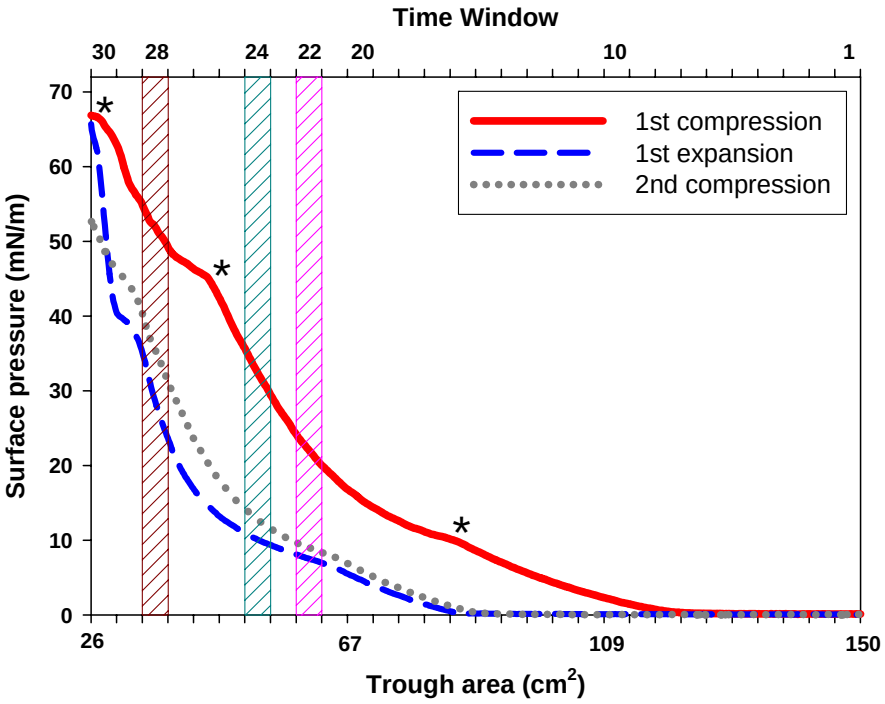

Figure S1. Compression and expansion isotherms of the DPPC-*d62*-POPG-PA-KL_4 monolayer under ambient atmospheric conditions. The red curve is the first compression isotherm; the blue curve is the first expansion isotherm; the gray curve is the second compression isotherm; the vertical columns are the three representative time windows.

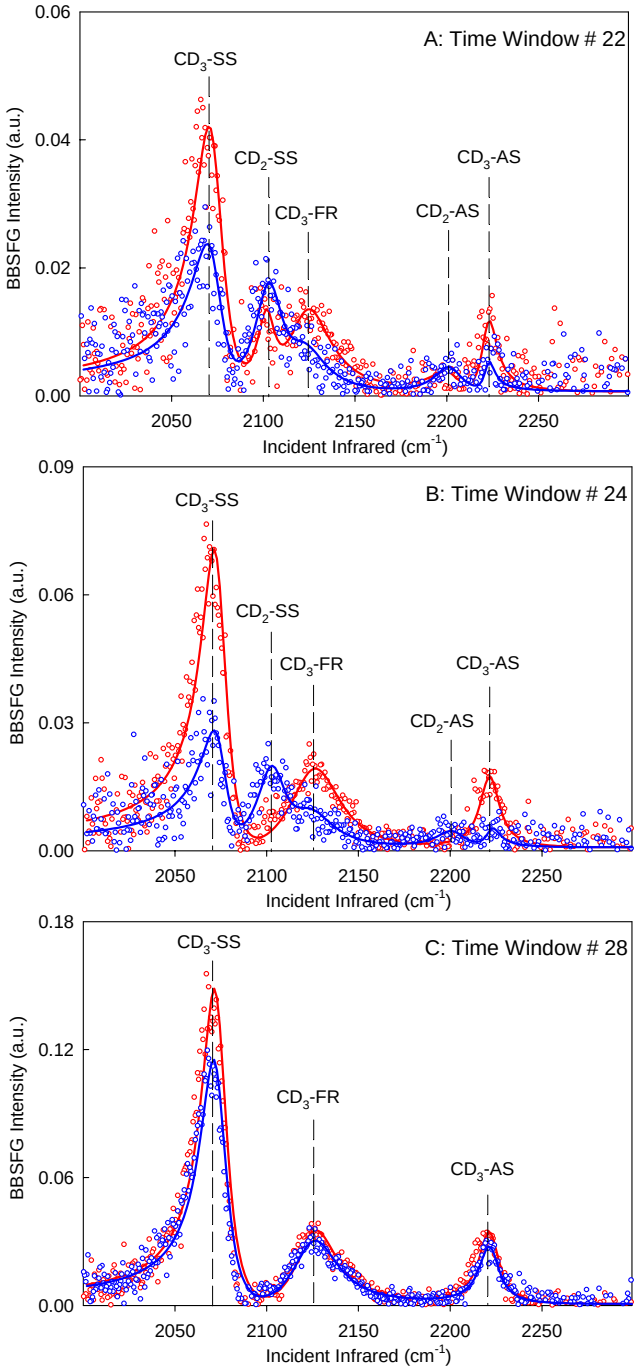

Figure S2. ssp BBSFG spectra of DPPC-*d62* in DPPC-*d62*-POPG-PA-KL_4 monolayer taken in the C-D stretching region in the three representative time windows under ambient atmospheric conditions. A: time window #22; B: time window #24; C: time window #28; red spectra: spectra for the first compression isotherm segments; blue spectra: spectra for the first expansion isotherm segments; solid curves: spectral fits; CD_3-SS: CD_3 symmetric stretch; CD_2-SS: CD_2 symmetric stretch; CD_3-FR: CD_3 Fermi resonance; CD_2-AS: CD_2 asymmetric stretch; CD_3-AS: CD_3 asymmetric stretch.

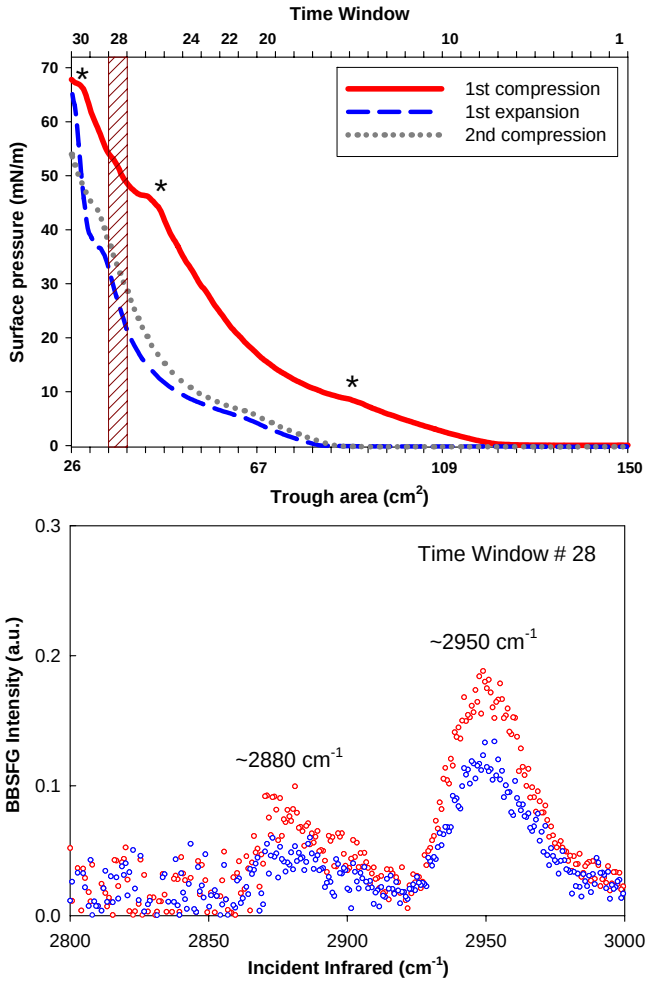

Figure S3. Compression and expansion isotherms of the DPPC-*d62*-POPG-PA-KL_4 monolayer (top) and ssp BBSFG spectra of DPPC-*d62* in DPPC-*d62*-POPG-PA-KL_4 monolayer taken in the C-H stretching region in the time window #28 under ambient atmospheric conditions (bottom). Red spectrum: spectrum for the first compression isotherm segment; blue spectrum: spectrum for the first expansion isotherm segment.

Table S1. DPPC-*d62* interfacial density reduction ΔN versus trough area reduction (ΔTA)*

Icomp-(CD_3-SS) (a.u.)	Iexpn-(CD_3-SS) (a.u.)	ΔN	TA-comp-1st (cm^2)	TA-expn-1st (cm^2)	ΔTA
3.49	2.68	12%	56	37	34%

*comp: compression; expn: expansion;

Icomp-(CD_3-SS): peak intensity of CD_3-SS during film compression;

Iexpn-(CD_3-SS): peak intensity of CD_3-SS during film expansion;

TA-comp-1st: trough area during the 1st film compression;

TA-expn-1st: trough area during the 1st film expansion.