Supporting Information for

Solid-state NMR Characterization of Lyophilized Formulations of Monoclonal Antibody Therapeutics.

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Figure S1. Representative hC-CP spectra of Lyo-NISTmAb (top), Lyo-S-NISTmAb (middle) and Lyo-R-NISTmAb (bottom). All spectra were recorded with a Tcp of 3 ms.



Figure S2. PCA scatter plots for hc-CP spectral series of Lyo-NISTmAb (blue), Lyo-R-NISTmAb (red), and Lyo-S-NISTmAb (yellow) for PC-1 vs PC-2 (left) and PC-2 vs PC-3 (right) with different Tcp subsets: 100us to 500 us (A and B), 250us to 4250us (C and D) and 2000us to 4250us (E and F).



Figure S3. Correlation plots for comparison between the PC-2 and PC-3 loading spectra from PCA comparisons between the Lyo-NISTmAb with Lyo-S-NISTmAb and Lyo-NISTmAb with Lyo-R-NISTmAb hc-CP series.

Max Tcp	Lyo-NISTmAb vs.		Lyo-NISTmAb vs		Lyo-S-NISTmAb vs.	
(ms)	Lyo-S NISTmAb		Lyo-R NISTmAb		Lyo-R-NISTmAb	
	Z-Distance	% Overlap	Z-Distance	% Overlap	Z-Distance	% Overlap
5000	1.95	34.19	12	N.D. [†]	N.D. [†]	N.D. [†]
4750	1.95	34.38	11.91	N.D. [†]	N.D. [†]	N.D. [†]
4500	1.94	34.53	12.02	0	2.03	33.96
4250	1.94	34.64	11.87	0	2.03	34.1
4000	1.94	34.73	11.87	0	2.03	34.16
3750	1.93	35.06	11.76	0	2.03	34.31
3500	1.92	35.38	11.7	0	2.02	34.4
3250	1.92	35.51	11.15	0	2.02	34.63
3000	1.91	35.89	11.04	0	2.01	34.68
2750	1.9	36.16	11.25	0	2	35.15
2500	1.89	36.59	11.38	0	1.99	35.27
2250	1.88	37.19	11.51	0	1.98	35.58
2000	1.86	37.59	11.26	0	1.87	35.95
1750	1.85	38.26	12	0	1.94	36.42
1500	1.83	39.04	10.37	0	1.89	37.36
1250	1.8	39.93	8.95	0	1.82	41.73
1000	1.76	40.76	2.5	N.D. [†]	N.D. [†]	N.D. [†]
750	1.71	43.17	12	0	1.73	41.42
500	1.64	45.87	11.91	0	1.93	38.2
250	1.48	55.01	12.02	29.86	3.43	13.27

Table S1. PCA Z-Score Analysis Metrics

 † N.D. denotes no data. Data were not acquired for the Lyo-R-NISTmAb sample at 5000, 4750 and 1000 ms τ_{cp} points.