Electronic Supplementary Information

Nanoarchitectonics of 3D networked bio-based binders for silicon anodes in lithium-ion batteries based on dynamic hydrogen bonding

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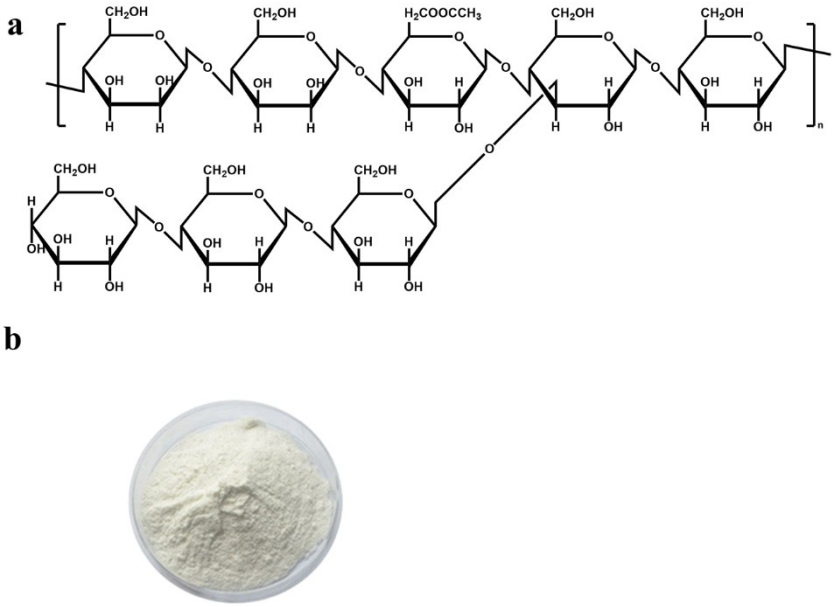

Fig. S1 Konjac glucomannan (a) Molecular structure, (b) Konjac in extract.

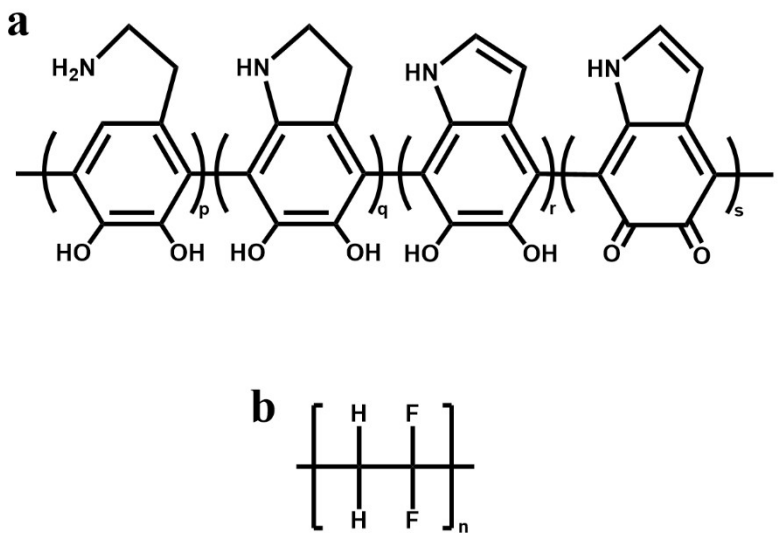

Fig. S2 Molecular Structure of (a) PDA, (b) PVDF.

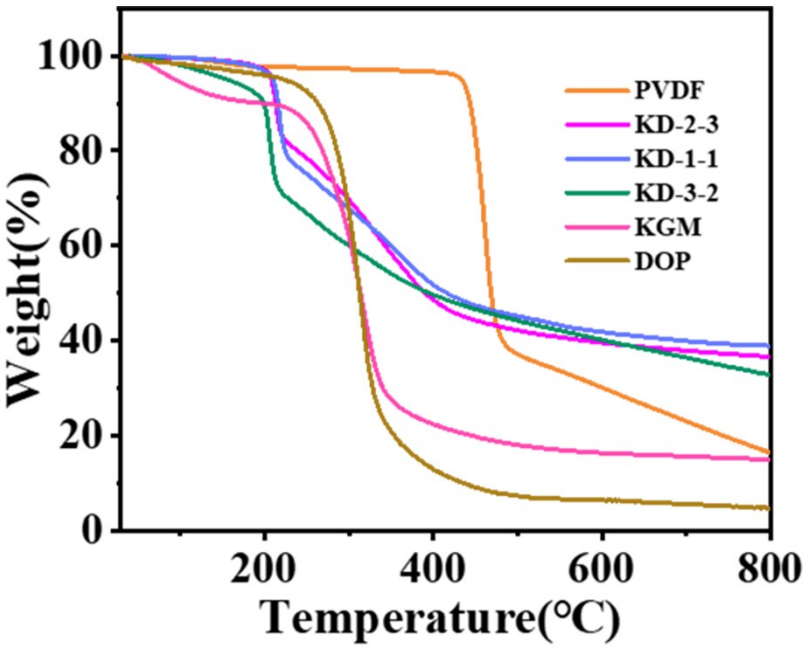

Fig. S3 Thermal weight loss curves for polymers.

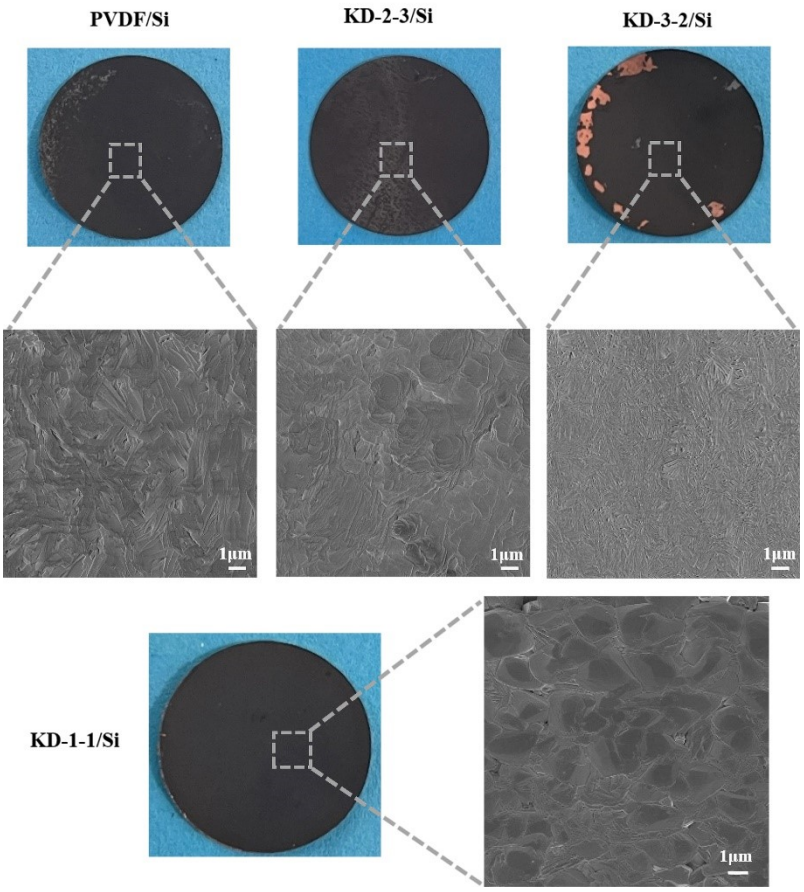

Fig. S4 Surface morphology after 180h of immersion.

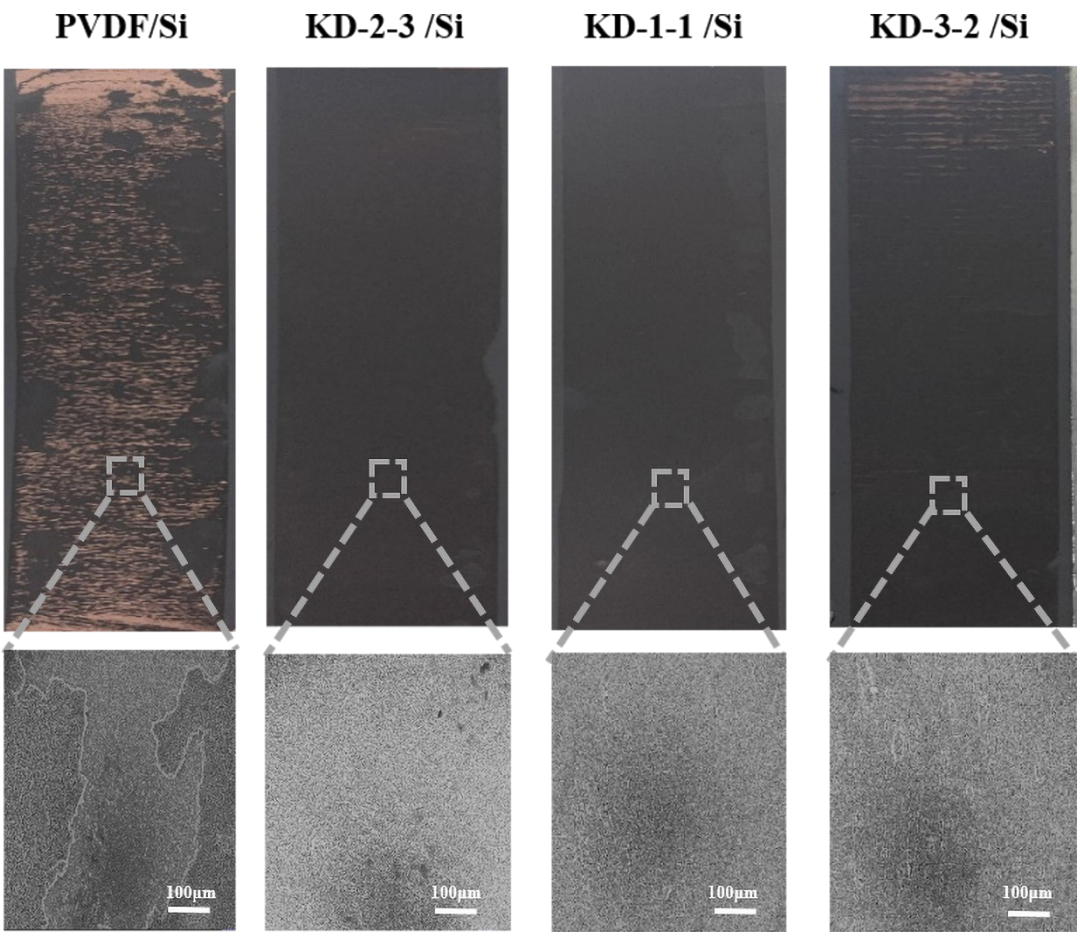

Fig. S5 Surface morphology after peeling.

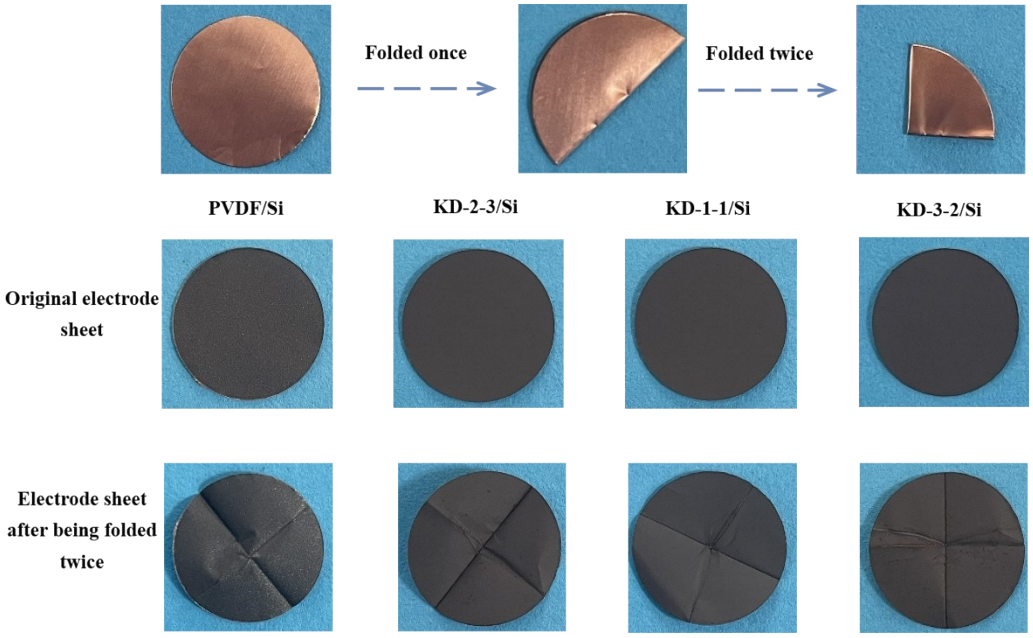

Fig. S6 Surface de-powdering of electrodes after bending twice.

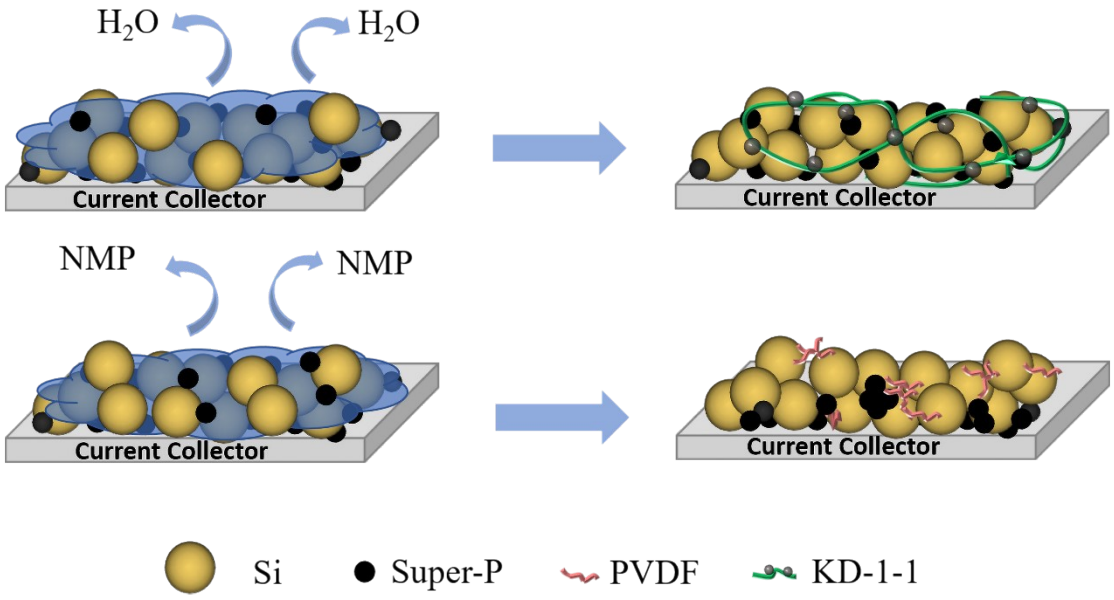

Fig. S7 The electrode composition distribution of KD-1-1 binder and PVDF binder after drying.

Table S1 Comparison of the cyclic performance of Si anode materials for lithium-ion batteries with different binders reported in the previous works.

Binder	Mass loading (mg cm^{-1})	Mass ratio	Current rate (C)	Cycle performance	Reference
Alg–C-chitosan	0.56	5:3:2	0.024(0.1A g^{-1})	750 mAh g^{-1} after 100 cycles	[1]
Li-Nafion	1.5-1.9	20:3:2	0.036(0.15A g^{-1})	660 mAh g^{-1} after 100 cycles	[2]
OS-CMC	0.4	6:2:2	0.095(0.4A g^{-1})	1922 mAh g^{-1} after 100 cycles	[3]
GG	0.64	6:2:2	0.095(0.4A g^{-1})	1323 mAh g^{-1} after 100 cycles	[4]
XG	0.59	6:2:2	0.095(0.4A g^{-1})	1026 mAh g^{-1} after 100 cycles	[4]
GA	0.75	6:2:2	0.095(0.4A g^{-1})	725 mAh g^{-1} after 100 cycles	[4]
CMC/MAH	1.18	6:2:2	0.238(1A g^{-1})	996 mAh g^{-1} after 120 cycles	[5]
CGG	0.8	6:2:2	0.238(1A g^{-1})	1138 mAh g^{-1} after 200 cycles	[6]
CMC-NaPAA-PAM	\	6:2:2	0.1	1210 mAh g^{-1} after 150 cycles	[7]
OG	1	6:2:2	0.1	1434 mAh g^{-1} after 50 cycles	[8]
TBA-VTLES	0.8-1.0	8:1:1	0.2	651 mAh g^{-1} after 40 cycles	[9]
KGM/PDA	1.13	8:1:1	0.3	1030 mAh g^{-1} after 80 cycles	This work

Reference

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