Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting Information

A Robust and Ion-Conductive Protein-Based Binder Enabling Strong Polysulfide Anchoring for High-Energy Lithium-Sulfur Batteries

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Table S1. Amino acid profile of soy protein

Amino acid	Percentage (wt%)	Amino acid	Percentage (wt%)
Glutamic acid	19.1	**Valine**	5.0
Aspartic acid	11.6	**Isoleucine**	4.9
Leucine	8.2	**Alanine**	4.3
Arginine	7.6	**Glycine**	4.2
Threonine	6.7	**Tyrosine**	3.8
Lysine	6.3	**Histidine**	2.6
Phenylalanine	5.2	**Tryptophan**	1.4
Serine	5.2	**Methionine**	1.3
Proline	5.1	**Cystine**	1.3

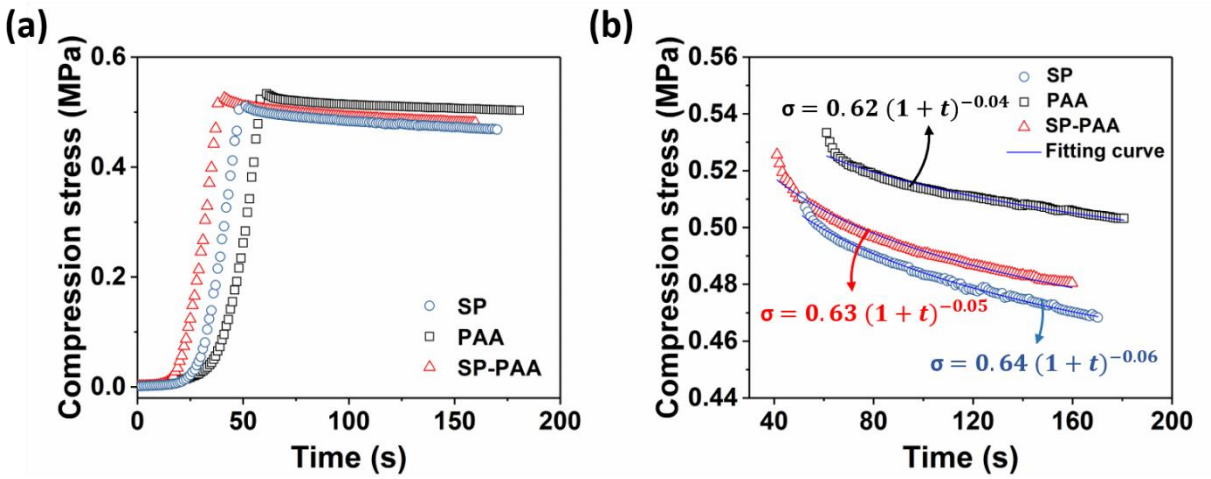

Figure S1. Mechanical properties of dry S cathodes. (a) – (b) The evolution of compression stress versus indentation time for as-prepared S cathodes with different binders, measured by compression and stress-relaxation.

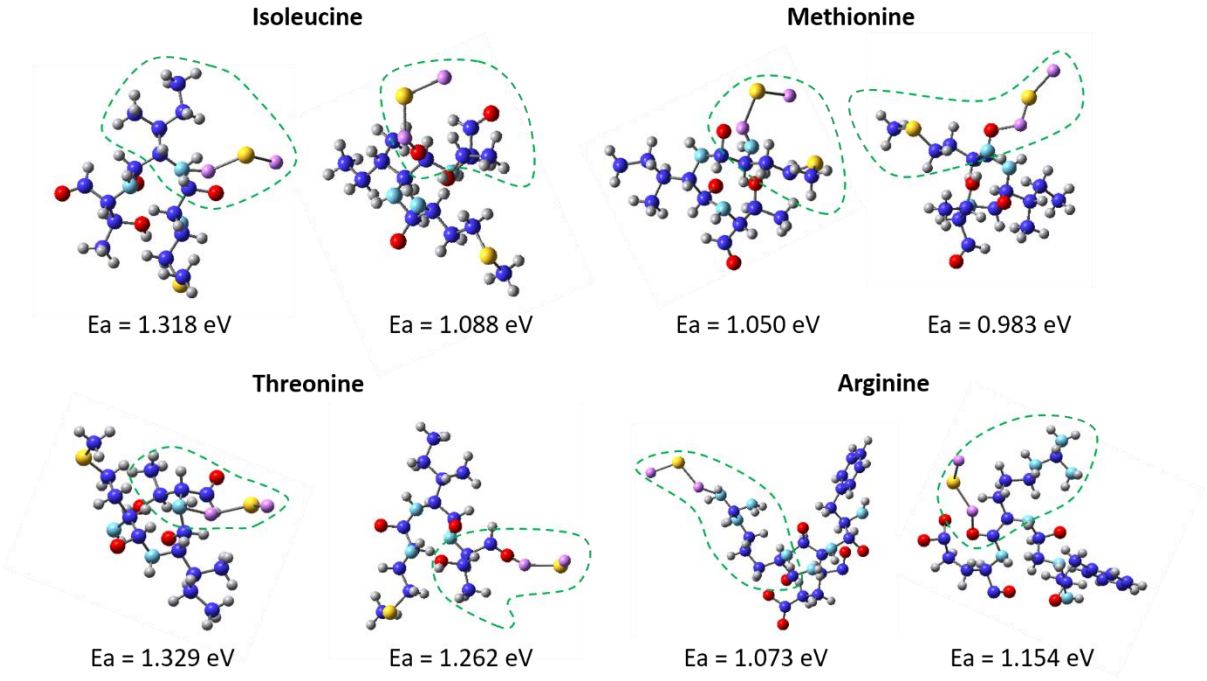

Figure S3. Adsorption geometry of Li_2S by various amino acids (Isoleucine, Methionine, Threonine and Arginine) via amine and carboxyl groups.

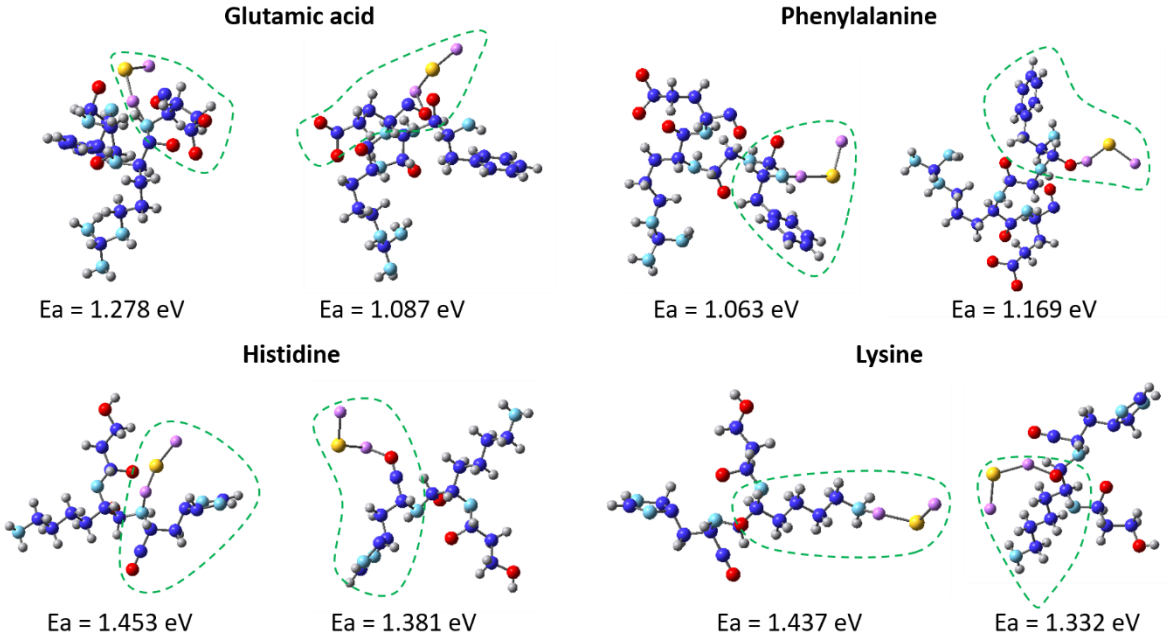

Figure S4. Adsorption geometry of Li_2S by various amino acids (Glutamic acid, Phenylalanine, Histidine and Lysine) via amine and carboxyl groups.

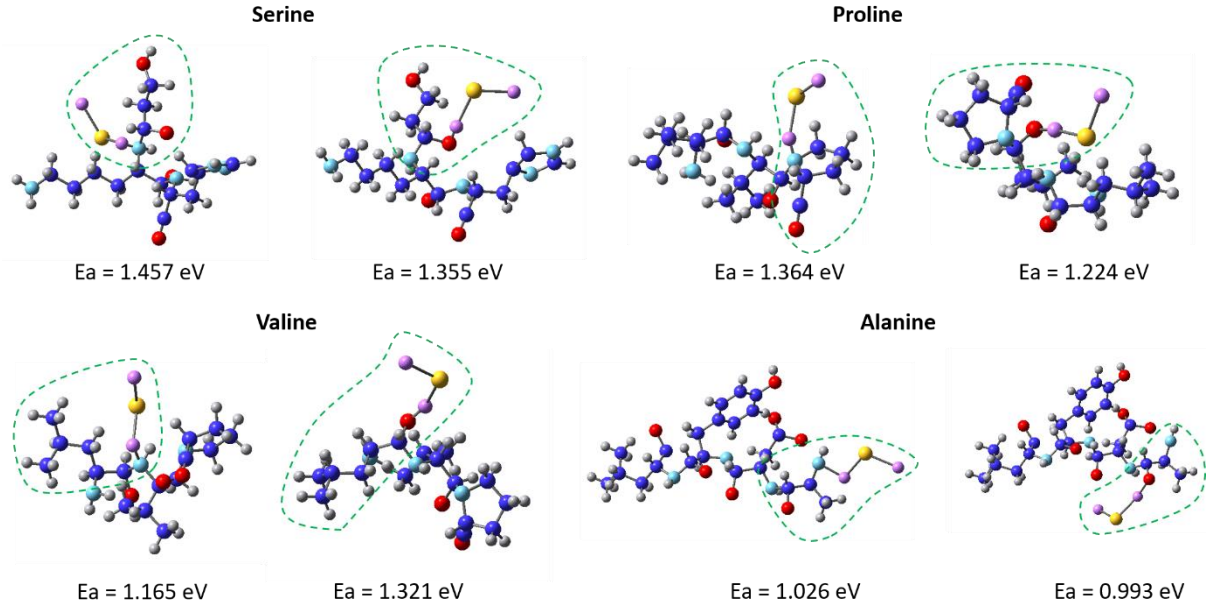

Figure S5. Adsorption geometry of Li_2S by various amino acids (Serine, Proline, Valine and Alanine) via amine and carboxyl groups.

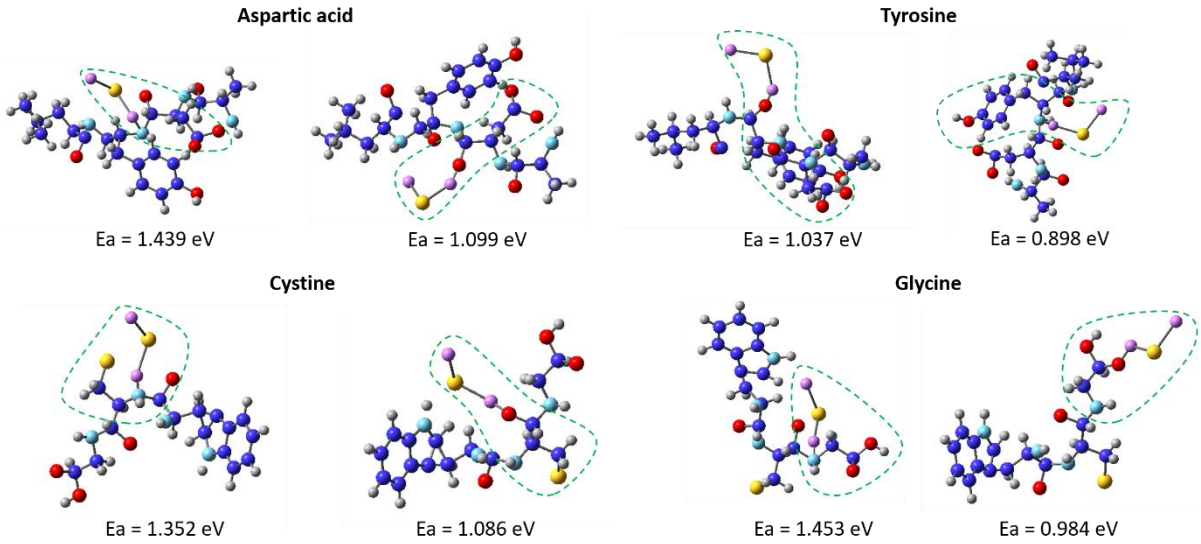

Figure S6. Adsorption geometry of Li_2S by various amino acids (Aspartic acid, Tyrosine, Cystine and Glycine) via amine and carboxyl groups.

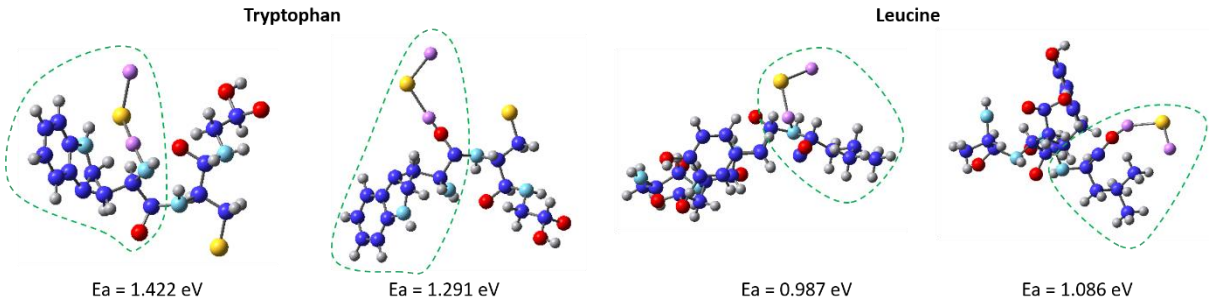

Figure S7. Adsorption geometry of Li_2S by various amino acids (Tryptophan and Leucine) via amine and carboxyl groups.

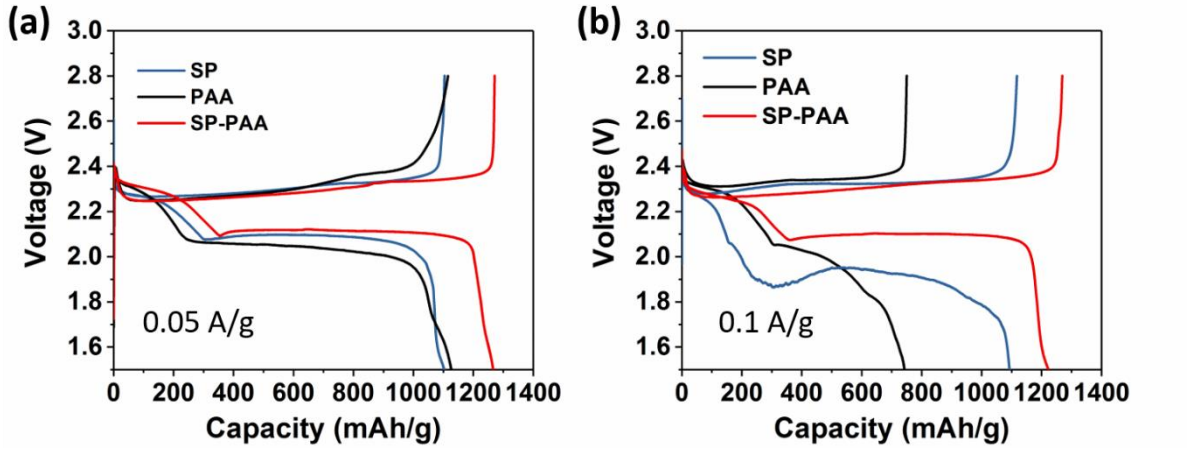

Figure S8. Voltage profiles of S cathodes with 2.8 mg/cm^2 S loading. (a) – (b) Charging/discharging curves of S cathodes with different binders at 0.05 and 0.1 A/g, respectively.