Electronic Supplementary Material (ESI) for Energy Advances.

Improved Coulombic efficiency of single-flow, multiphase flow batteries via use of strong-binding complexing agents

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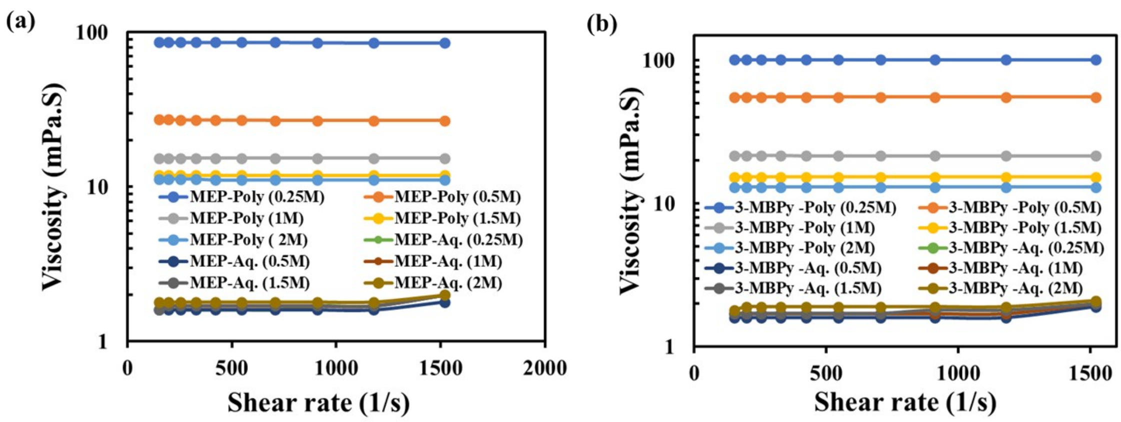

Fig. S1 Measured aqueous and polybromide phases viscosities with shear rate with change in bromine concentration between 0.25 M to 2 M with 2 M $ZnBr_2$ and 0.5M MEP (Fig (a)) and 3-MBPy (Fig (b)) at 25° C.

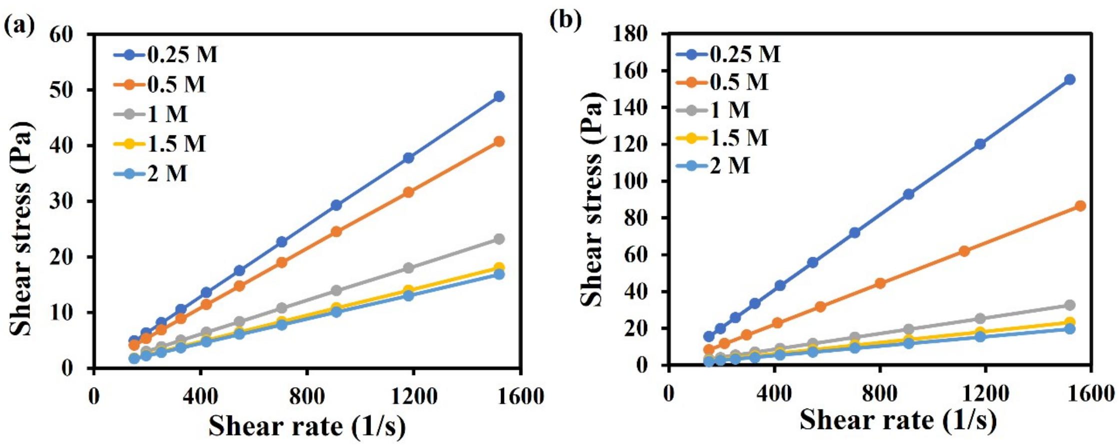

Fig. S2 Newtonian behaviour of polybromide phase with different initial bromine concentration between 0.25 M to 2 M with 2 M $ZnBr_2$ and 0.5M MEP (Fig (a)) and 3-MBPy (Fig (b)) at 25° C.

Table I The benchmark for selecting appropriate BCAs and their optimal performance

Battery configuration	Electrode material	Electrolyte and BCA		Coulombic efficiency (CE)	Ref.
Membrane	Anode→ Graphite Cathode→ carbon	2.5 M of zinc bromide, zinc chloride and potassium chloride	1M[C2MPyrr]Br	91.1%	1
			1M [C2MPip]Br	80.3%	
			1M [C2Py]Br	91.1%	
			1M [C2OHPy]Br	83.4%	
			1M [C2MIm]Br	90.6%	
			1M[C2OHMIm]Br	71.4%	
Membrane	Carbon felt	2 M ZnBr2,	0.6 M MEP·Br	95.39%	2
Porous separator	Graphite felt	3M ZnBr2 2M HClO4	1M MEM & 1M MEP	≈80%	3
Membraneless	Graphite	2 M ZnBr2, 0.5 M Br2	1 M MEP	73%	4
Membraneless	Graphite	2 M ZnBr2, 0.5 M Br2	0.5 M MEP	47%	Present work
			0.5 M 3-MBPy	69%	

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