Supplementary Information (SI) for Journal of Materials Chemistry A.

Supporting Information

Advancements towards optimization of metal-organic frameworks-based polymer electrolyte membranes for aqueous redox flow batteries

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Table S1 Cell performance of Inorganic-based ARFBs

Type	Positive	Negative	Electrolyte	E_{Cell} (V)	EE (%)	Ref
Vanadium-Based	$VO_2^+ + e^- \leftrightarrow VO^{2+}$	$V^{2+} \leftrightarrow V^{3+} + e^-$	1.7-2M V in 1.5-5M H_2SO_4, HCl, H_3PO_4, and CH_3SO_3H	1.26	82-87	1-3
		Zinc-based				
Zn-Br	$Br_2 + 2e^- \leftrightarrow 2Br^-$	$Zn \leftrightarrow Zn^{2+} + 2e^-$	2M $ZnBr_2$-3M KCl-0.8M MEP and 2.25M $ZnBr_2$-0.5M $ZnCl_2$-0.8M MEP+Br_2	1.85	69.4-82.1	4-6
	$I_3^- + 2e^- \leftrightarrow 3I^-$	$Zn \leftrightarrow Zn^{2+} + 2e^-$	0.5-5.0M ZnI_2	0.9-1.27	67.8-91	7
Zn-I_2 (Zn-I_2Br)	$I_3^- + 2e^- \leftrightarrow 3I^-$	-	7.5M KI-3.75M $ZnBr_2$	1.35	81	8
	-	-	2-6M KI+1-3 M $ZnBr_2$	1.33	80	9
	$2I^- + Br^- \leftrightarrow I_2Br^-$ -	$Zn^{2+} + 2e^- \leftrightarrow Zn$	5M ZnI_2-2.5M $ZnBr_2$	1.35	NA	10
Zn-Ce	$Zn \leftrightarrow Zn^{2+} + 2e^-$	$2Ce^{4+} + 2e^- \leftrightarrow 2Ce^3$	1.5MZn$(CH_3SO)_2$/0.2M $Ce(CH_3SO_3)_3$ in 0.5M CH_3SO_3H	2.43	75	11
Alkaline Zn-I_2	$I_3^- + 2e^- \leftrightarrow 3I^-$	$Zn(OH)_4^{2-} + 2e^- \rightarrow Z$	Zn plate in 6M KOH‖‖6M KI-6M I_2	1.79	80	12
Alkaline Zn-Fe	$Fe(CN)_6^{4-} \leftrightarrow Fe(CN)^3$	$Zn(OH)_4^{2-} + 2e^- \rightarrow Z$	1.0M $Na_4Fe(CN)_6$–3M KOH│0.5M $Zn(OH)_4^{2-}$–4M NaOH	1.74	89	13

	$Fe(CN)^{4-}_{6} \leftrightarrow Fe(CN)^{3}_{(}$	$Zn(OH)^{2-}_{4} + 2e^{-} \rightarrow Z$	0.4M $Zn(OH)_4^{2-}$+ 3M NaOH||0.8M $Na_4Fe(CN)_6$+3M KOH	1.81	87.72	14
Zn-Fe	$2Fe^{3+} + 2e^{-} \leftrightarrow 2Fe^{2}$	$Zn(OH)^{2-}_{4} + 2e^{-} \rightarrow Z$	0.3M$Na_2[Zn(OH)_4]$–0.5 M NaCl–2.4M NaOH||0.6M$FeCl_2$ –0.5MNaCl–1MHCl	≈1.7	75.9	15
Neutral Zn-Fe	$Fe^{3+}(Gly)_2 + e^{-} \leftrightarrow F$	$Zn^{2+} + 2e^{-} \leftrightarrow Zn$	0.8M $ZnBr_2$–2.0M KCl||1.6M $FeCl_2$–3.2M glycine–2.0 M KCl	1.4	84	16
Acidic Zn-Fe	$Fe^{3+} + e^{-} \leftrightarrow Fe^{2+}$	$Zn^{2+} + 2e^{-} \leftrightarrow Zn$	1M $ZnSO_4$–1.5M HAc/NaAc||1M $FeCl_2$–1.5M H_2SO_4	1.53	71.1	17
	$Fe^{3+} + e^{-} \leftrightarrow Fe^{2+}$	$Zn^{2+} + 2e^{-} \leftrightarrow Zn$	1.6M $ZnCl_2$–0.8M $FeCl_2$–2M NH_4Cl–2gL^{-1} PEG8000	1.2	68	18
		Iron-based				
Fe-Cr	$Fe^{2+} + e^{-} \leftrightarrow Fe^{3+}$	$Cr^{2+} \leftrightarrow Cr^{3+} + e^{-}$	1M$FeCl_2$/1M$CrCl_3$ in 2–3M HCl	1.18	73	19
Fe-V	$Fe^{2+} + e^{-} \leftrightarrow Fe^{3+}$	$V^{2+} \leftrightarrow V^{3+} + e^{-}$	1M $FeCl_2$ in 2M HCl/2M V in 4M H_2SO_4	1.02	80	20
All-Iron	$Fe^{2+} + e^{-} \leftrightarrow Fe^{3+}$	$Fe^{2+} + 2e^{-} \leftrightarrow Fe$	$FeCl_2$ (Negative) $FeCl_2$ & $FeCl_3$ (Positive)	1.21	>45	21
Fe-organic complex	$Fe(CN)^{3-}_{6} + e^{-} \leftrightarrow Fe($	$[Fe(TEOA)OH]^{-} + e$	Fe-TEOA in 0.8M alkaline (Negative)	1.22	73	21
	$Fe(CN)^{3-}_{6} + e^{-} \leftrightarrow Fe($	$Cr(PDTA)^{-} + e^{-} \leftrightarrow C$	chrome alum with PDTA in the presence of KOH and buffered at pH 9.5 with 0.2 M KB_i (Negative) $K_3Fe(CN)_6$ and $K_4Fe(CN)_6$ (0.75 M total Fe conc.) and buffered with 25 mM KBi (Positive)	2.13	76-80	22
	$[Co(mTEA)(H_2O)] +$	$[Fe(TEOA)OH]^{-} + e$	cobalt with 1-[Bis(2-hydroxyethyl)amino]-2-propanol in 5M NaOH (Positive) iron with triethanolamine in	0.93	71	23

			5 M NaOH (Negative)			
		Polysulphide-based				
Polysulphide-Bromine (PSB)	$Br_2 + 2e^- \leftrightarrow 2Br^-$	$S_4^{2-} + 2e^- \leftrightarrow 2S_2^{2-}$	5M NaBr/ 1.3M Na_2S_5 and 1M NaOH	1.36	72	24
Polysulphide-Iodine(PSIB)	$I_3^- + 2e^- \leftrightarrow 3I^-$	$2S^{2-} \leftrightarrow S_2^{2-} + 2e^-$	2-6M KI+2-3.3M K_2S_2	1.05	63-73	25
Polysulphide-Iron	$Fe(CN)_6^{3-} + e^- \leftrightarrow Fe($	$\frac{1}{2}S_4^{2-} + e^- \leftrightarrow S_2^{2-}$	1M $K_3Fe(CN)_6$-1M Na_2S_2	0.91	74	26
Air-breathing S-O_2	Acidic catholyte: $2H_2O \leftrightarrow O_2 + 4H^+ + $ Alkaline catholyte: $4OH^- \leftrightarrow O_2 + 2H_2O +$	$xS_y^{2-} + 2(y-x)e^- \leftrightarrow$ $xS_y^{2-} + 2(y-x)e^- \leftrightarrow$	1M Li_2S_4-1M LiOH or NaOH (Negative) 1M Li_2SO_4 or Na_2SO_4-0.1 or 0.5M H_2SO_4(Positive), sandwiched by a solid-state electrolyte (LiSICON)	1.26	-	27
Polysulphide-polybromine	$Br_3^- + 2e^- \leftrightarrow 3Br^-$	$2S^{2-} \leftrightarrow S_4^{2-} + 2e^-$	Solid state electrolyte (NASICON ($Na_3Zr_2Si_2PO_{12}$) and LATP ($Li_{1+x+y}Al_xTi_{2-x}P_{3-y}Si_yO_{12}$)	1.55	≈50	
Polysulphide-polyiodide	$3I^- \leftrightarrow I_3^- + 2e^-$	$S_2^{2-} + 2e^- \leftrightarrow 2S^{2-}$		1.05	80	28
Br-V	$Br_2 + 2e^- \leftrightarrow 2Br^-$	$V^{2+} \leftrightarrow V^{3+} + e^-$	3.5M V in 7M HBr + 2M HCl/ 2M V in 4M H_2SO_4	1.30	-	29
Mn-V	$Mn^{2+} + e^- \leftrightarrow Mn^{3+}$	$V^{2+} \leftrightarrow V^{3+} + e^-$	0.3M V^{3+} in 5M H_2SO_4/0.3M Mn^{2+} in 5M H_2SO_4	1.77	63	30
		Lead-based				
Pb-Ce	$2Ce^{3+} \leftrightarrow 2Ce^{4+} + 2e$	$Pb^{2+} + 2e^- \leftrightarrow Pb$	1.5MPb^{II}methanesulfonate in 1.0 M MSA (Negative); 1.0MCe^{III}methanesulfonate in 1.0M MSA (Positive)	1.7	83	31
Soluble-Pb	$Pb^{2+} + 2H_2O + 2e^-$	$Pb^{2+} + 2e^- \leftrightarrow Pb$	Lead(II) in methanesulfonic acid	1.78	65	32
		Polyoxometalate (POM)-based				
All-POM (Symmetric POM-based)	$SiV^{V}_3W^{VI}_9O_{40}^{7-}$/ $SiV^{IV}_3W^{VI}_9O_{40}^{10-}$	$SiV^{IV}_3W^{VI}_9O_{40}^{10-}$ /$SiV^{IV}_3W^{V}_3W^{VI}_6O_{40}^{13-}$)	Tungsten based Keggin POM K_6H[A-α-$SiV_3W_9O_{40}$] (ASi)	1.0	50	33
Vanadium, tungsten,	$PV_3W_9O_{40}^{9-} \leftrightarrow PV_3W_9($	$PV_3W_9O_{40}^{9-} + 3e^- \leftrightarrow$	A-α-$PV_3W_9O_{40}^{6-}$, B-α-$PV_3W_9O_{40}^{6-}$, and	>2	-	34

phosphorus-based POM			$P_2V_3W_{15}O_{62}^{9-}$			
All Tungsto-cobalt-POM	$Co^{II}W_{12}O_{40}^{6-}\leftrightarrow Co^{III}W$	$CoW_{12}O_{40}^{6-}+2e^{-}+$	tungsten-cobalt heteropoly acid (H6[CoW12O40])	-	86	35
Asymmetric POM-based	$2Br^{-}\leftrightarrow Br_2+2e^{-}$	$[P_2W_{18}O_{62}]^{6-}+2e^{-}$	$Li_6[P_2W_{18}O_{62}]$ (Negative) HBr/Br_2 (Positive)	-	76	36
PTA-POM based	$3I^{-}-2e^{-}\leftrightarrow I_3^{-}$	$[PW_{12}O_{40}]^{5-}+2e^{-}$	1.6 M HI 0.25 M PTA (Positive) , 12-1.1 M HI 0.25 M PTA (Negative)	0.84	80.1	37
Polyoxovanadate –POM based	$[PV_{14}O_{42}]^{9-}\leftrightarrow[H_xPV$	$[SiW_{12}O_{40}]+4e^{-}\leftrightarrow[$	$[SiW_{12}O_{40}]^{4-}$ (SiW_{12})(Negative) PV_{14}(Positive)		-	38

Table S2 Cell performance of organic-based ARFBs

Type	Positive	Negative	Electrolyte	E_{Cell} (V)	EE (%)	Ref
		Viologen-based				
Methyl viologen-based	$4-OH-TEMPO\leftrightarrow[$	$MVi^{2+}+e^{-}\leftrightarrow MVi^{+}$	3M in 1.5M NaCl methyl viologen (anolyte) 4-hydroxy-2,2,6,6-tetramethylpiperidin-1-oxyl (Catholyte)	1.25	62.5	39
Ferrocene-based	$[FcN]^{+}\leftrightarrow[FcN]^{2+}$ -	$[(Me)(NPr)V]^{3+}+e$	1.3M in 2M NaCl 1,10-bis[3-(trimethylammonio) propyl]4,40-bipyridinium tetrabromide (Anolyte) BTMAP-Fc (Catholyte)	0.75	≈65	40
Viologen/Br_2	$Br_2+2e^{-}\leftrightarrow 2Br^{-}$	$(2HO\text{-}V)^{2+/1+}$ and $(2HO\text{-}V)^{1+/0}$	2M in H_2O $(2HO\text{-}V)Br_2$ (anolyte) and KBr-MEP (Catholyte)	1.49 and 1.89	80	41
Viologen-Thiazolo	$[N^{Me}TEMPO]^{+}\leftrightarrow[N$	$[(NPr)_2TTz]^{4+}+e^{-}$	1.1 M in 2M NaCl $[(NPr)_2TTz]Cl_4$ (anolyte) N^{Me}-TEMPO (catholyte)	1.44	70	42
Viologen-Ferrocene	-	$4MV^{\cdot+}+O_2+2H_2O$	((3-trimethylammonio)propyl)-ferrocene dichloride (catholyte) bis(3-trimethylammonio)propyl viologen tetrachloride (Anolyte)	0.748	-	43

Sulphonate viologen-KI	$I_3^- + 2e^- \leftrightarrow 3I^-$	$(SPr_2)V + e^- \leftrightarrow [(SP$	2M in H_2O $(SPr)_2V$ (anolyte) KI (Catholyte)	1.0	67	44
Sulphonate viologen-Br	$Br_2 + 2e^- \leftrightarrow 2Br^-$	$(SPr_2)V + e^- \leftrightarrow [(SP$	$(SPr)_2V$ (anolyte) NH_4Br (catholyte)	1.51	80	45
Poly viologen	$TEMPO \leftrightarrow TEMPO^+$	$Viol^{++} + e^- \leftrightarrow Viol^{\cdot}$	PolyVi (anolyte) PolyTEMPO (Catholyte)	1.19	75	46
		TEMPO-based				
TEMPO-Viologen	$4 - OH - TEMPO \leftrightarrow [$	$MVi^{2+} + e^- \leftrightarrow MVi^+$	3M in 1.5M NaCl methyl viologen (anolyte) 4-hydroxy-2,2,6,6-tetramethylpiperidin-1-oxyl (Catholyte)	1.25	62.5	39
N[Me]-TEMPO based	$TEMPO^{+\cdot} \leftrightarrow TEMPO$	$Viol^{++} + e^- \leftrightarrow Viol^{\cdot}$	N,N,N-2,2,6,6-heptamethyl piperi-dinyloxy-4-ammoniumchloride (TEMPTMA) (Catholyte) Viologen derivative N,N'-dimethyl-4,4-bipyridiniumdichloride (MV) (anolyte)	1.4	70	47
GTMA+ grafted 4-OH-TEMPO	$g^+ - TEMPO^+ + e$	$Zn^{2+} + 2e^- \leftrightarrow Zn$	0.3M $ZnCl_2$+0.3MNH_4Cl (anolyte) 0.2M 4-hydroxy-TEMPO in 1M NaCl (catholyte)	1.55	72.7	48
TEMPO-4-sulphate based	$R - TEMPO^+ + e^-$ R=solubility promoting substituent	$Zn^{2+} + 2e^- \leftrightarrow Zn$	$ZnCl_2$+NH_4Cl (anolyte) Aqueous2,2,6,6-Tetramethyl piperidine-N-oxyl (catholyte)	1.5	-	49
TMAP-TEMPO	$TMAP - TEMPO^+ +$	$BTMAP^{++} + e^- \leftrightarrow B$	TMAP-TEMPO (catholyte) BTMAP-Vi (anolyte)	1.5	60-80	50
TEMPO-phenazine	$p(TEMPO - co - zw$	$MV^{++} + e^- \leftrightarrow MV^{+\cdot}$	N,N'-dimethyl-4,4'-bipyridinium dichloride (MV) (anolyte) p(TEMPO-co-zwitterion)(catholyte)	1.3	93	51
VIOTEMP	$TEMPO^+ + e^- \leftrightarrow TE$	$Viol^{++} + e^- \leftrightarrow Viol^{\cdot}$	TEMPO (catholyte) Viologen (anolyte)	1.16	-	52
TEMPO-polymer	$P1^+ + e^- \leftrightarrow P1$ P1=TEMPO containing copolymer	$MV^{++} + e^- \leftrightarrow MV^{\cdot+}$	(2,2,6,6-Tetramethylpiperidin-1-yl)oxyl-containing polymer(catholyte) dimethyl viologen (anolyte)	1.3	85	53
Poly(TEMPO)-Zinc	$TEMPO^+ + e^- \leftrightarrow TE$	$Zn^{2+} + 2e^- \leftrightarrow Zn$	$ZnCl_2$(anolyte)TEMPO-polymer(catholyte)	1.69	80	54
		Quinone-based				
Quinone-Br	$Br_2 + 2e^- + 2H^+ \leftrightarrow$	$AQDSH_2 \leftrightarrow AQDS + 2$	HBr/Br_2(catholyte) 9,10-anthraquinone-2,7-	0.81	NA	55

			disulphonicacid (AQDS)(anolyte)			
Alkaline-Quinone	$Fe(III)(CN)^{3-}_{6} + 2e$	$2,6-reDHAQ \leftrightarrow 2,6-$	$Fe(CN)_6^{4-}$(Catholyte)2,6-dihydroxyanthraquinone (2,6-DHAQ)(anolyte)	1.2	84	56
Naphtha-Quinone	$K_3Fe(III)(CN)_6 + e$	$2,3-reHCNQ \leftrightarrow 2,3-$	2-hydroxy-3-carboxy-1,4-naphthoquinone(2,3-HCNQ)(anolyte)$K_4Fe(CN)_6$ (catholyte)	1.02	68.8	57
Alkaline Benzoquinone	$K_3Fe(III)(CN)_6 + e$	$2,5-reDHBQ \leftrightarrow 2,5-$	2,5-dihydroxy-1,4-benzoquinone (anolyte) $K_4Fe(CN)_6$(catholyte)	1.21	65	58
Ammonium anthraquinone	$I^{-}_{3} + 2e^{-} \leftrightarrow 3I^{-}$	$reAQDS(NH_4)_4 \leftrightarrow AQ$	0.75M 9,10-anthraquinone-2,7-disulfonic diammoniumsalt AQDS-$(NH4)_2$ in 0.75 M NH_4I (anolyte) 2.25M NH_4I aqueous solution (catholyte)	0.865	70	59
Alkaline-Quinone	$Fe(III)(CN)^{3-}_{6} + 2e$	$2,6-reDBEAQ \leftrightarrow 2,6$	$Fe(CN)_6^{4-}$(Catholyte) 4,40-((9,10-anthraquinone-2,6-diyl)dioxy)dibutyrate (2,6-DBEAQ) (anolyte)	1.05	88	60
Phosphonate-Functionalized Quinone	$e(III)(CN)^{3-}_{6} + 2e^{-}$	$2,6-reDPPEAQ \leftrightarrow 2,$	((9,10-dioxo-9,10-dihydroanthracene-2,6-diyl)bis(oxy))bis(propane-3,1-diyl))bis(phosphonic acid)(anolyte)$K_4Fe(CN)_6$ $K_3Fe(CN)_6$ (catholyte)	1.0	65	61
Water-Miscible Quinone	$e(III)(CN)^{3-}_{6} + 2e^{-}$	$rePEGAQ \leftrightarrow PEGAQ +$	$K_4Fe(CN)_6K_3Fe(CN)_6$ (catholyte) 1.5 M AQ-1,8-3E-OH (anolyte)	1.0	NA	62
		Nitrogen-centered heteroatomic molecule based				
phenazine-based	$Fe(III)(CN)^{3-}_{6} + 2e$	$[Phenazine - R]^{n} + 2$	(7,8-dihydroxyphenazine-2-sulfonic acid)(anolyte) $Fe(CN)_6^{4-/3-}$(Catholyte)	1.4	82	63
Fused-Ring Phenazine	$K_3Fe(III)(CN)_6 + e$	-	benzo[a]hydroxyphenazine-7/8-carboxylicacid (anolyte)$K_4Fe(CN)_6$ (catholyte)	1.27	80	64
flavin mononucleotide	$Fe(CN)^{3-}_{6} + e^{-} \leftrightarrow Fe$	$FMN^{5-} + 2e^{-} \leftrightarrow FM$	$K_4Fe(CN)_6$ (catholyte) sodium salt of flavin mononucleotide (anolyte)	1.03	80	65
Phenothiazine-Based	$VO^{2+} \leftrightarrow VO^{+}_{2} + e^{-}$	$MB + 2e^{-} + 2H^{+} \leftrightarrow$	methylene blue (MB) (anolyte) V(II) (catholyte)	0.83	76	66

Table S3 Synthesis strategies of pristine MOFs

MOFs	Synthesis method	Metal/Ligand/Solvent	Ref
MIL-53(Cr)	Hydrothermal method	$Cr(NO_3)_3.xH_2O$/1,4-BDC/HF:H2O	67
Fe-MIL-88A	Ultrasound synthesis	$FeCl_3.6H_2O$/ fumaric acid	68
ZIF-8	Colloidal chemistry	$Zn(NO_3)_2{\cdot}6H_2O$/2-methylimidazole/Methanol	69
MOF-5	Solvothermal	$Zn(NO_3)_2{\cdot}4H_2O/H_2BDC$/DMF/chlorobenzene	70
Cr-MIL-101	Solvothermal	$Cr(NO_3)_3{\cdot}9H_2O/H_2BDC/H_2O$ (add 1M HF aq.)	71
Al-MIL-53-NH_2	Solvothermal	$Al(NO_3)_3{\cdot}9H_2O$/ H_2BDC-NH_2/ DMF	72
UiO-66	Solvothermal	$ZrCl_4/H_2BDC$/DMF	73
Co-MOF-74	Microwave-assisted	$Co(NO_3)_2{\cdot}6H_2O/H_2DHBDC$/DMF:EtOH:$H_2O$	74
HKUST-1	Microwave-assisted	$Cu(NO_3)_2{\cdot}3H_2O$/ H_3BTC/ EtOH	75
Mg-MOF-74	Sonochemical	$Mg(NO_3){\cdot}6H_2O$/ H_4DHBDC/ DMF: EtOH:H_2O	76
Al-MIL-100	electrochemical	$Al(NO_3)_3{\cdot}9H_2O$/ H_3BTC/ H2O:EtOH	77
ZIF-4	mechanochemical	ZnO/ Him/DMF	78

Table S4 Compilation of some conducting MOFs and derivatives

MOFs	Condition	Conductivity/ S cm^{-1}	Ref
{[Co(bpy)$(H_2O)_4$](btec)$_{0.5}$.H_2O}	80^oC and 98% RH	4.85 $\times10^{-3}$	79
$Ni_3(HITP)_2$	25^oC	4$\times10^{-3}$	80
[$(CH_3)_2NH_2$][In(*m*-TTFTB)]	70^oC and 98% RH	4.05$\times10^{-3}$	81
Ni-CAT-1	25^oC	3.2$\times10^{-2}$	82
$(NH_4)_2$(adp)[$Zn_2(ox)_3$]$\cdot3H_2O$	25^oC and 98% RH	8 $\times10^{-3}$	83
BUT-8(Cr)A	80^oC and 100% RH	1.27 $\times$ 10^{-1}	84
NNU-66a	180^oC and anhydrous	1.94$\times10^{-3}$	85
MOF-74(Mg)–urea	25^oC and 95% RH	2.64$\times10^{-2}$	86
MIP-202(Zr)	90^oC and 95% RH	1.1$\times10^{-2}$	87
TMOF-2	90^oC and 98% RH	1.23$\times10^{-4}$	88
Ni-HAB	65^oC	45$\times$ 10^{-1}	89
β-PCMOF2	85°C and 90% RH	10^{-1}	90
FeTHQ	27^oC	3.3±0.55	91
[Co(DCDPP)]$\cdot5H_2O$	80°C and 97% RH	3.9 $\times$ 10^{-2}	92
$Cu_3(HITP)_2$	25^oC	0.2	93
{H[$(N(CH_3)_4)_2$][$Gd_3(NIPA)_6$]}$3H_2O$	75°C and 98% RH	7.17$\times10^{-2}$	94
MFM-300(Cr)$\cdot SO_4(H_3O)_2$	25^oC and 99% RH	1.26$\times10^{-2}$	95
[Sr($DMPhH_2IDC)_2$]n	100°C and 98% RH	0.92$\times10^{-3}$	96
{[Cd(p-TIPh$H_2IDC)_2$]$\cdot H_2O$}n	100°C and 98% RH	1.24$\times10^{-4}$	96
Ni-PTC ([$Ni_3(C_{24}S_{12})$]n)	127^oC	~10	97

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