Supplementary Information

Redox Mediators as Charge Agent Changing Electrochemical Reactions

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Table S1. Potential redox mediators (RMs) applicable for various electrochemical systems

S. No.	Name redox mediator	Chemical formula	Electrolyte	Redox potential	Reference
1	1,5-naphthalenediamine (NDA)	$C_{10}H_{10}N_2$	1 M LiTFSI/TEGDME	3.64 *vs* Li^+/Li	[1]
2	Tetrathiafulvalene (TTF)	$C_6H_4S_4$	1 M LiTFSI/TEGDME	3.56 *vs* Li^+/Li	[2]
3	Ferrocene (FC)	$C_{10}H_{10}Fe$	1 M LiTFSI/TEGDME	3.60 *vs* Li^+/Li	[2]
4	Lithium iodide	LI	1 M LiTFSI/TEGDME	3.0 V *vs* Li^+/Li	[3, 4]
5	5,10-dimethylphenazine (DMPZ)	$C_{14}H_{14}N_2$	1 M LiTFSI/TEGDME	3.0 V *vs* Li^+/Li	[3]
6	(2,2,6,6-tetramethylpiperidinyloxyl) (TEMPO)	$C_9H_{18}NO$	1 M LiTFSI/diglyme	3.74 V *vs* Li^+/Li	[5]
7	4-Methoxy-2,2,6,6-tetramethylpiperidinyloxyl (4-methoxy-TEMPO)	$C_{10}H_{20}NO_2$	1 M LiTFSI in diglyme	3.76 V *vs* Li^+/Li	[6]
8	Cobalt Bis(terpyridine) $(Co(Terp)_2)$	$C_{30}H_{22}CoN_6$	$Co(Terp)_2$	3.12 - 3.38 *vs* Li^+/Li	[7]
9	N, N, N′, N′-tetramethyl-p-phenylenediamine (TMPD)	$C_{10}H_{16}N_2$	1 M LiTFSI/TEGDME	3.33 *vs* Li^+/Li	[2]
10	10-methyl-10H-phenothiazine (MPTA)	$C_{13}H_{11}NS$	1 M LiTFSI/TEGDME	3.67 V *vs* Li^+/Li	[2]
11	2,5-di-*tert*-butyl-1,4-benzoquinone (DBBQ)	$C_{14}H_{20}O_2$	1 M LiTFSI/TEGDME or DME	2.5 – 2.6 V *vs* Li^+/Li	[8]
12	4, N, N-trimethylaniline (TMA)	$C_9H_{13}N$	1 M LiTFSI/TEGDME	3.81 vs *vs* Li^+/Li	[1]
13	1-phenylpyrrolidine (PPD)	$C_{10}H_{13}N$	1 M LiTFSI/TEGDME	3.89 *vs* Li^+/Li	[1]
14	Cobalt phthalocyanine (CoPC)	$C_{32}H_{16}CoN_8$	1 M LiTFSI/TEGDME	3.82 V vs. *vs* Li^+/Li	[9]
15	Butyl-hydroxytoluene (BHT)	$C_{15}H_{24}O$	1 M LiTFSI/TEGDME	3.0 V vs. *vs* Li^+/Li	[10]
16	Naphthacene (NC)	$C_{18}H_{12}$	1 M LiTFSI/TEGDME	3.83 *vs* Li^+/Li	[1]
17	1,4-dioxane	$C_4H_8O_2$	1 M LiTFSI/TEGDME	6.87 *vs* Li^+/Li	[1]

18	N,N-dimethylformamide	C_3H_7NO	1 M LiTFSI/TEGDME	7.08 *vs* Li^+/Li	*1*
19	Tris[4-(diethylamino)phenyl] amine (TDPA)	$[(C_2H_5)_2NC_6H_4]_3N$	0.1 M LiTFSI/TEGDME	3.1 V *vs* Li^+/Li (1 e)	11
20	Cobaltocene ($CoCp_2$)	$CoC_{10}H_{10}$	1 M LiTFSI in DME & DOL at a 1:1 vol. ratio	2.0 V *vs* Li^+/Li	12
21	Poly(2,2,6,6-tetramethyl-1-piperinidyloxy-4-yl methacrylate) (PTMA)	$C_{13}H_{23}NO_3$	1M $LiPF_6$ in 1:1 by vol. mixture of EC/DEC	3.6 V *vs* Li^+/Li	13
22	Iron Phthalocyanine (FePc)	$C_{32}H_{16}FeN_8$	0.1 M LiTFSI/ TEGDME and 0.002 M FePc	Fe^{III}/ Fe^{II} 3.65 V and Fe^{II}/Fe^{I} 2.5 V *vs* Li^+/Li	14
23	Ethyl Viologen (EtV)	$C_{14}H_{18}N_2$	0.3 M LiTFSI/ BMPTFSI added 2 mM $EtV(OTf)_2$	2.4 V *vs* Li^+/Li	15
24	N,N,-bis(salicylidene) ethylenediaminocobalt (Co-salen)	$C_{16}H_{14}CoN_2O_2$	0.2 M $LiClO_4$ in DMSO	-0.115 V *vs* $Ag/AgNO_3$	16
25	Cobalt porphyrin (noted Co(II)-Po)	$C_{20}H_{14}CoN_4$	0.2 M $LiClO_4$ in DMSO	0.082 V *vs* $Ag/AgNO_3$	16
26	Potassium ferricyanide/ potassium ferrocyanide	$K_3Fe(CN)_6/K_4Fe(CN)_6$	1 M Na_2SO_4/1 M Na_2SO_4	0.2 to 0.4 V *vs* Ag/AgCl	17
27	1,4-Benzoquinone (BQ)	$C_6H_4O_2$	0.1 M $Mg(TFSI)_2$/DMSO	-0.07 *vs* NHE	*18*
28	Cobalt(II) 5,10,15,20-tetraphenyl-21H,23H-porphine (Co(II)TPP)	$C_{44}H_{28}CoN_4$	0.1 M $Mg(TFSI)_2$/DMSO	0.75 *vs* NHE	*18*
39	Silicotungstic acid	$H_4[SiW_{12}O_{40}]$	1 M H_3PO_4 (PH=10)	+0.019 and -0.212 V *vs* NHE	19, 20
30	Nickel hydroxide	$Ni(OH)_2/NiOOH$	1 M KOH	0.5 /0.45V *vs* Hg/HgO	21

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