

Melting point, boiling point, and viscosity of select ether solvents (at 25°C unless noted)

#	Acronym	Solvent	M.P. (°C)	B.P. (°C)	Viscosity (cP)
1	DIOX	1,3 dioxolane	-97	74-75	0.589
2	DME	1,2 dimethoxyethane	-58	85	0.407
3	THF:	tetrahydrofuran	-108	65-57	0.459
4	2MeTHF	2-methyl tetrahydrofuran	-137	78-80	0.467

Figure 1

Lot No.	Solvent Ratio	Solvent Composition	Solute
1113	65:35	DIOX:DME (control)	LiI
1114	65:35	THF:DME	LiI
1115	35:30:35	DIOX:THF:DME	LiI
1116	35:30:35	DIOX:2MeTHF:DME	LiI
1117	35:30:35	DIOX:THF:2MeTHF	LiI
1118	67:33	(Lot 1113 solvents):THF	LiI
1119	67:33	(Lot 1113 solvents):2MeTHF	LiI
1120	67:33	(Lot 1113 solvents):DMP	LiI
1122	65:35	DIOX:DME	LiTfSI
1123	25:25:25:25	EC:DEC:DMC:MA	LiTfSI
1124	25:25:25:25	EC:DEC:DMC:EA	LiTfSI
1125	50:25:25	DIOX:MA:PC	LiTfSI
1126	50:25:25	DIOX:MA:EC	LiTfSI
1127	50:25:25	DIOX:EA:EC	LiTfSI
1128	65:35	THF:DME	LiTfSI
1129	35:30:35	DIOX:THF:DME	LiTfSI
1130	35:30:35	DIOX:2MeTHF:DME	LiTfSI
1131	35:30:35	DOIX:THF:2MeTHF	LiTfSI

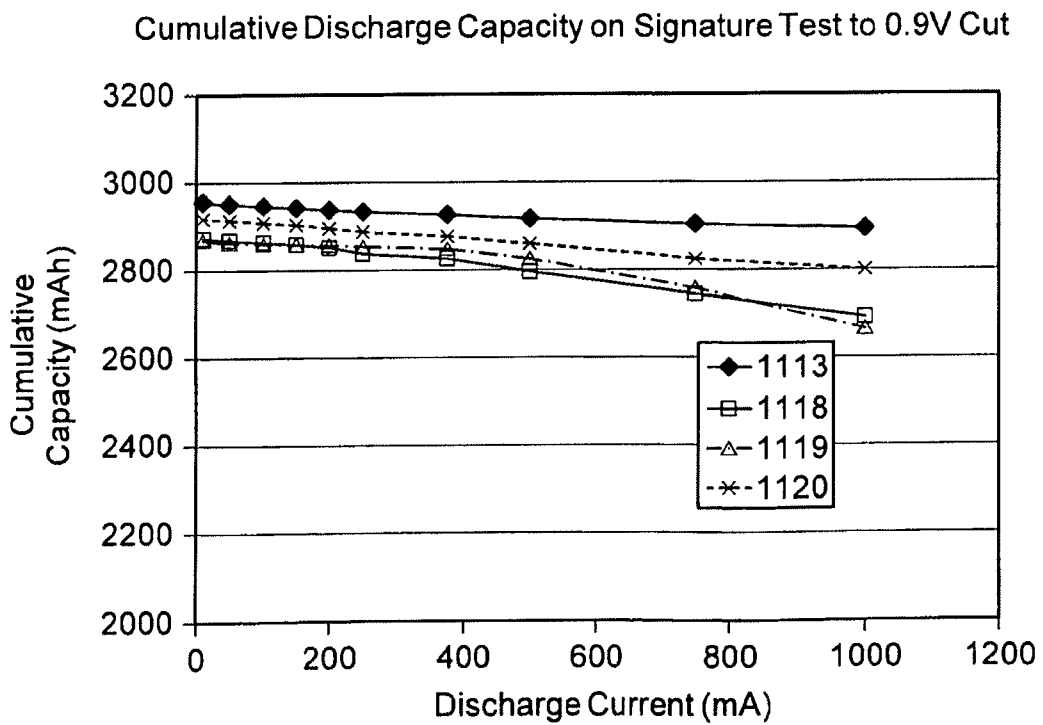
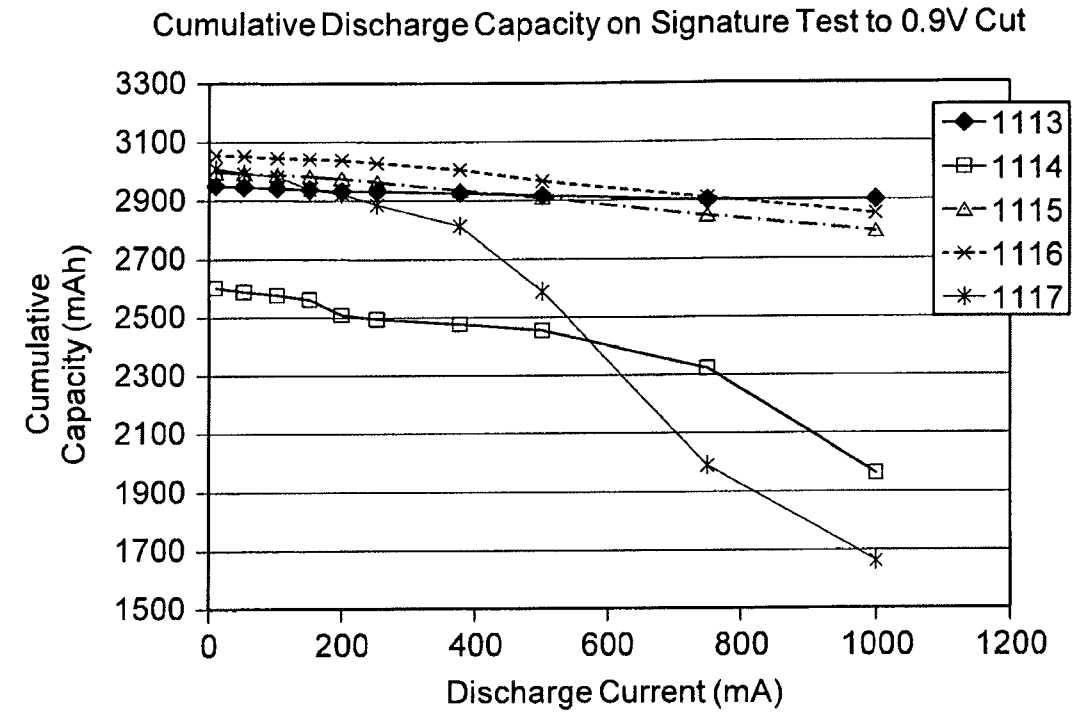
* All solvent ratios and compositions are in the order listed (i.e., 65:35 DIOX:DME means 65 vol.% of DIOX and 35 vol.% of DME)

**All solutes provided at approximately 0.75 moles per liter of solvent

Figure 2

	Service (minutes) at 21C		Service (minutes) at -20C		Service (minutes) at -40C	
Lot#	(1.0V cut)	(0.9V cut)	(1.0V cut)	(0.9V cut)	(1.0V cut)	(0.9V cut)
1113	172	174	126	144	0	0
1114	97	118	59	81	0	0
1115	160	168	110	130	5	7
1116	162	171	58	66	0	0
1117	86	100	48	64	1	37
1118	152	162	108	129	52	78
1119	145	160	84	106	0	0
1120	162	168	111	130	0	0
1122	178	180	133	152	0	48
1123	174	178	0	0	0	0
1124	171	175	0	0	0	0
1125	173	175	0	0	0	0
1126	173	175	0	0	0	0
1127	176	177	0	0	0	N/A
1128	173	175	104	124	0	0
1120	180	184	132	150	0	02
1130	177	179	120	140	0	0
1131	174	178	98	121	0	33

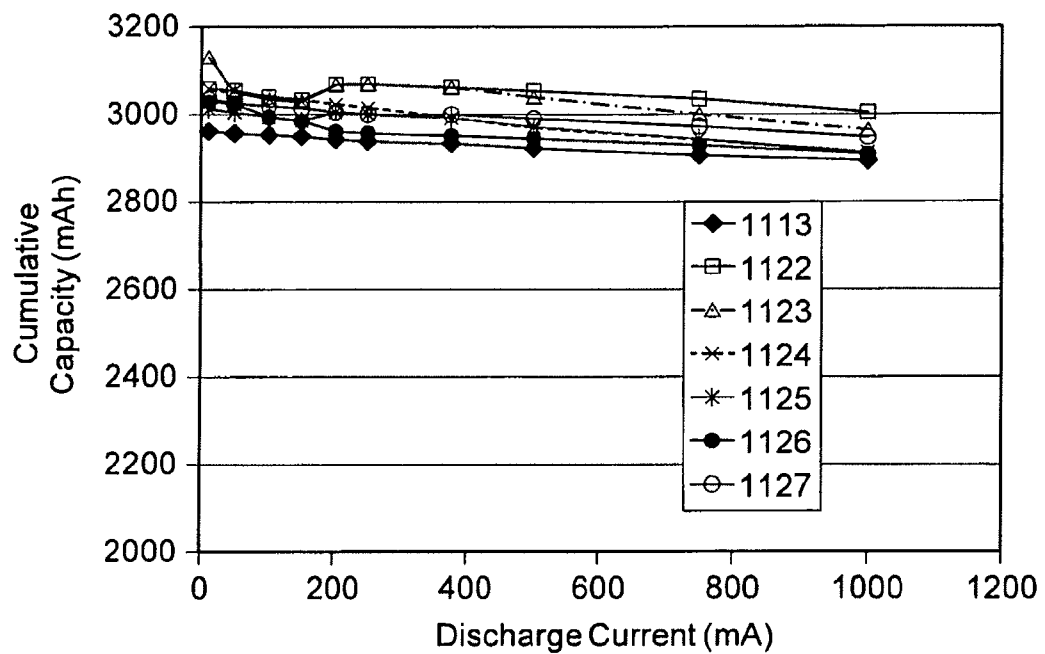
Figure 3

Figure 4

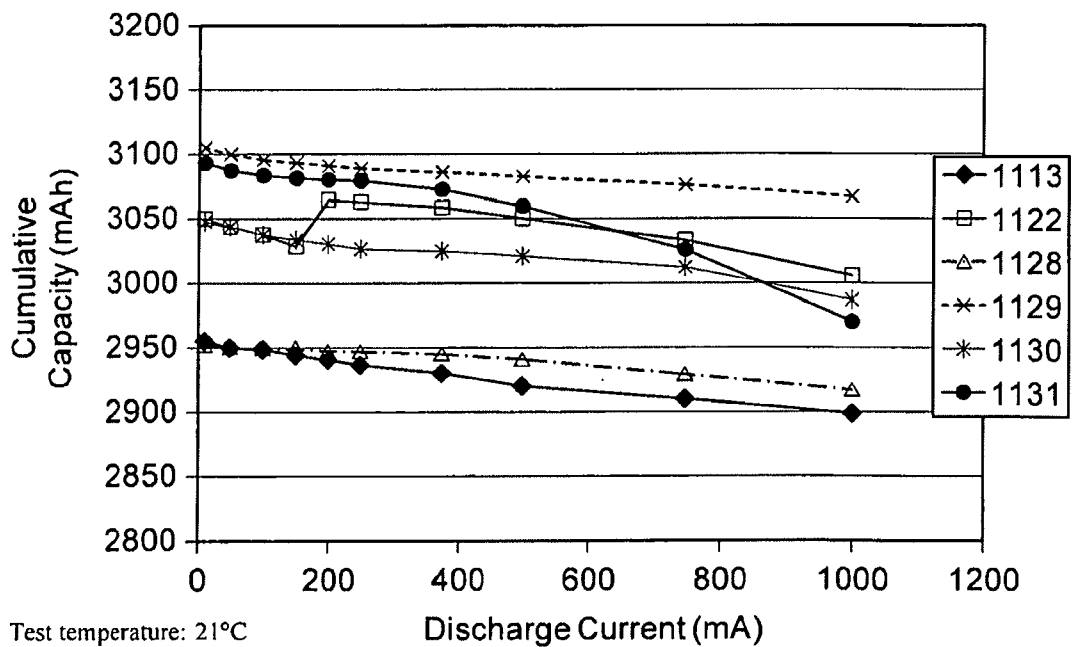
Test temperature: 21°C

Figure 5

Cumulative Discharge Capacity on Signature Test to 0.9V Cut



Cumulative Discharge Capacity on Signature Test to 0.9V Cut

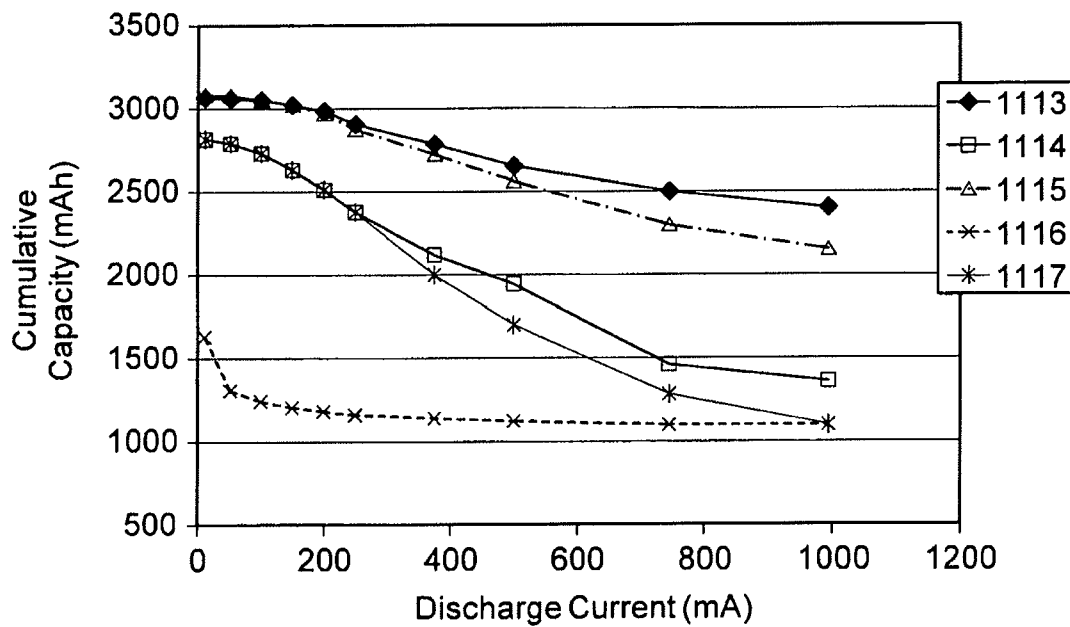


Test temperature: 21°C

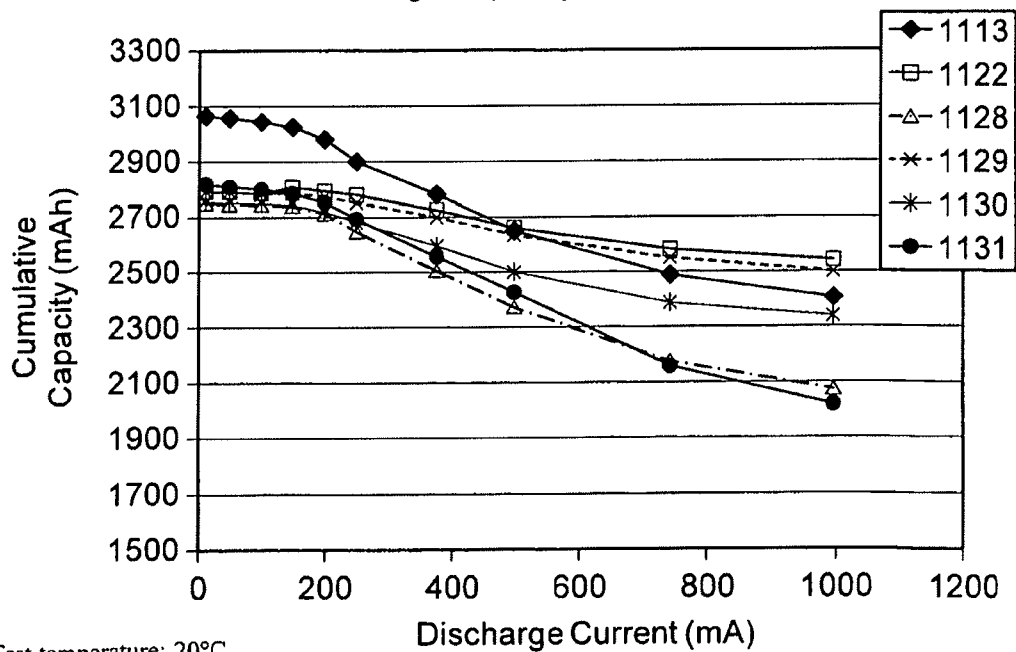
Discharge Current (mA)

Figure 6

Cumulative Discharge Capacity on Signature Test to 0.9V Cut



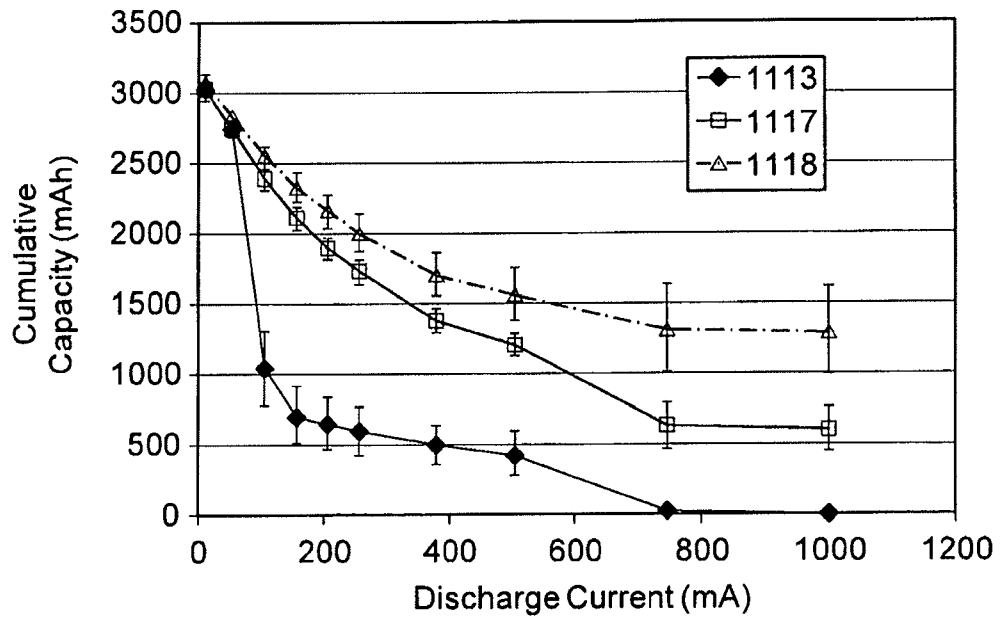
Cumulative Discharge Capacity on Signature Test to 0.9V Cut



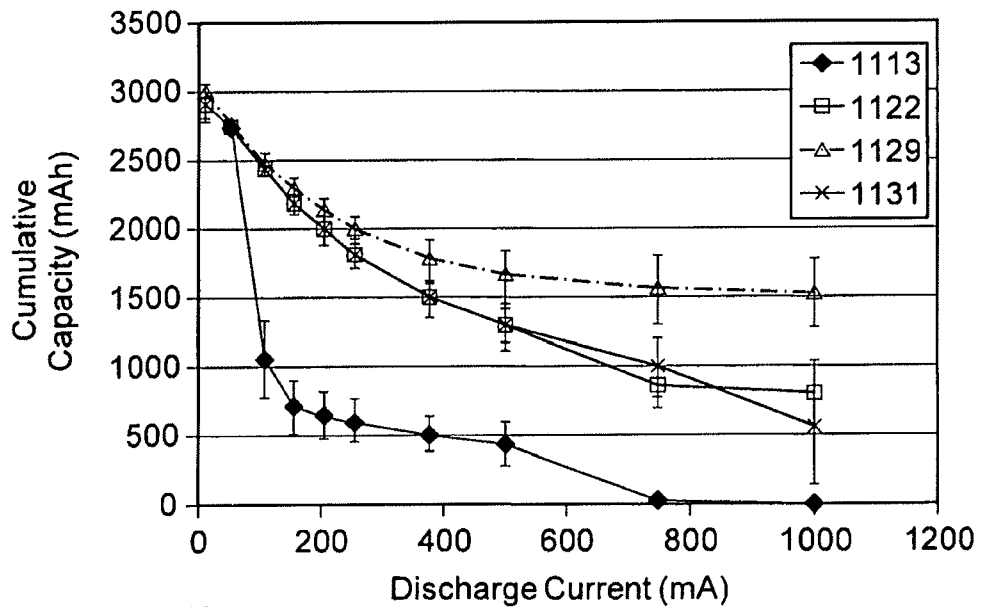
Test temperature: 20°C

Figure 7

Cumulative Discharge Capacity on Signature Test to 0.9V Cut



Cumulative Discharge Capacity on Signature Test to 0.9V Cut



Test temperature: -40°C

Lot #	Salt	Discharge at 40°C				Discharge at 20°C		Discharge at 21°C		Discharge at 21°C	
		Solvent blends				1000 mA to 0.9V cut		1000 mA to 0.9V cut		1000 mA to 0.9V cut	
		DIOX (v/v)	DME (v/v)	THF (v/v)		(Min)	% of control	(Min)	% of control	(Min)	% of control
		DIOX (v/v)	DME (v/v)	THF (v/v)							
1218	LiI	35.0%	43.4%	21.6%	1.5	2402%	12%	138	100%	172	97%
1219	LiI	50.0%	25.0%	25.0%	91	141261%	191	139	101%	166	93%
1220	LiI	35.0%	21.6%	43.4%	86	102774%	173	118	86%	152	86%
1221	LiI	65.0%	11.7%	23.3%	0.12	182%	146	109	79%	156	88%
1222	LiI	65.0%	23.3%	11.7%	0.10	149%	194	139	101%	172	97%
1223	LiI (control)	65.0%	35.0%	0.0%	0.06	100%	40	138	100%	178	100%
Optimized (1508)	LiI	57.3%	23.8%	18.9%	94	145898%	200	143	103%	171	96%
1224	LiI	43.3%	23.3%	33.3%	94	147038%	202	133	96%	162	91%

Figure 8

Lot #	Salt	Solvent				Discharge -40°C		Discharge -20°C		Discharge -20°C		Discharge 21°C		Discharge 21°C	
		Solvent				1000 mA to 0.9V cut		1000 mA to 0.9V cut		DSC		1000 mA to 0.9V cut		DSC	
		DIOX (w/w)	DME (w/w)	THF (w/w)	DIOX (v/v)	DME (v/v)	THF (v/v)	% of control	(Min)	% of control	(Min)	% of control	(Min)	% of control	(Min)
1178	0.75m LiImido	39.6%	39.9%	20.4%	35.0%	43.4%	21.6%	148%	154	101%	59	90%	180	99%	327
1179		54.8%	22.3%	22.9%	50.0%	25.0%	25.0%	141%	148	98%	81	123%	176	98%	319
1180		55.0%	34.9%	10.1%	50.0%	39.0%	11.0%	105%	141	93%	78	119%	176	97%	325
1181		69.5%	30.5%	0.0%	65.0%	35.0%	0.0%	100%	151	100%	66	100%	181	100%	322
1182		39.4%	19.8%	40.7%	35.0%	21.6%	43.4%	97%	146	97%	76	116%	174	96%	316
1183		69.2%	10.1%	20.7%	65.0%	11.7%	23.3%	78%	133	88%	80	121%	176	97%	310
1185		78.4%	10.6%	10.9%	75.0%	12.5%	12.5%	89%	117	78%	67	102%	175	97%	288
1186		54.6%	9.7%	35.6%	50.0%	11.0%	39.0%	59%	129	85%	66	100%	181	100%	317
1187		69.4%	20.3%	10.4%	65.0%	23.3%	11.7%	57%	129	85%	70	106%	181	100%	319
1188		28.8%	35.2%	36.0%	25.0%	37.5%	37.5%	82%	134	89%	76	116%	173	96%	319
1189	0.75m LiImido	48.1%	21.1%	30.9%	43.3%	23.3%	33.3%	110%	150	99%	92	141%	175	97%	326
1184		69.0%	0.0%	31.0%	65.0%	0.0%	35.0%	72%	93	62%	90	137%	178	99%	317
1188		54.5%	0.0%	45.5%	50.0%	0.0%	50.0%	86%	144	95%	66	100%	171	95%	312
1190		39.2%	0.0%	60.8%	35.0%	0.0%	65.0%	109%	147	97%	104	158%	174	98%	322

Figure 9

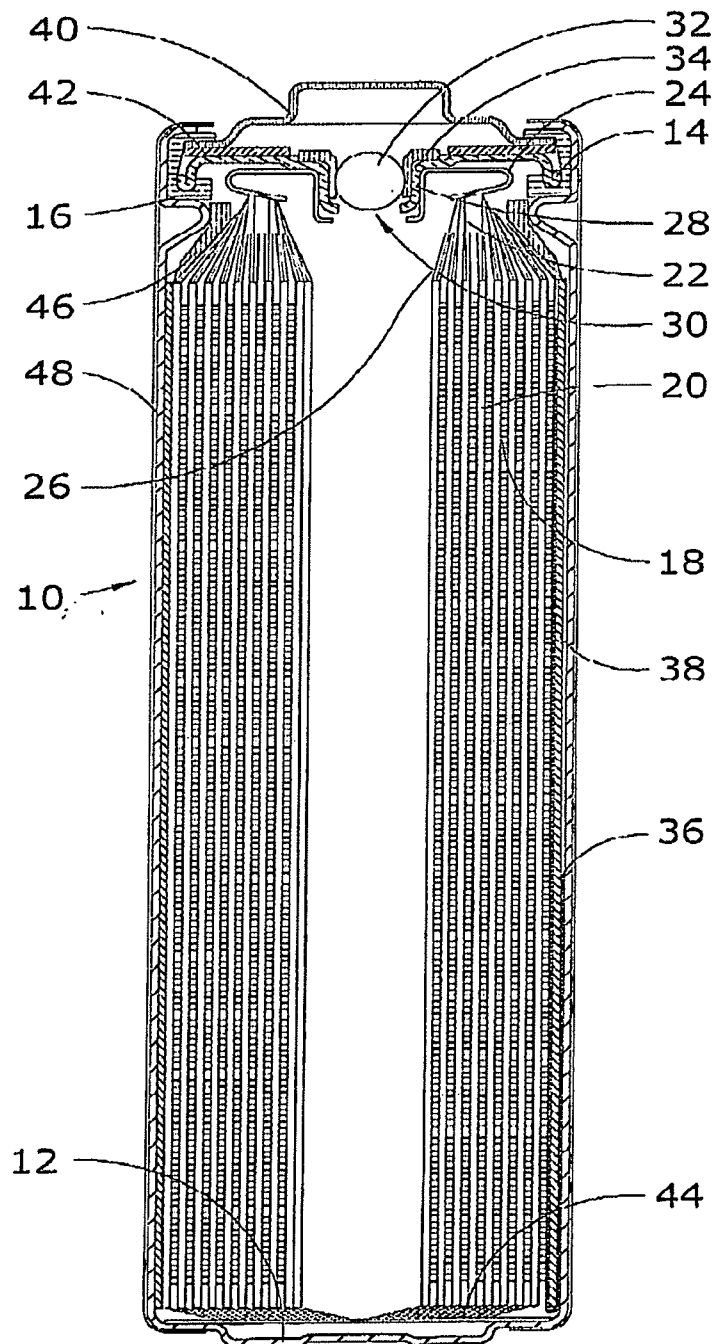


FIGURE 10