

## Supporting information

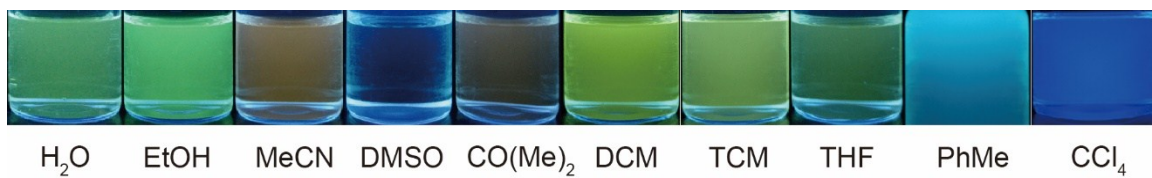
### **A single 9-Mesityl-10-Methylacridinium ion as solvatochromic sensor array for multicolor visual discrimination of solvents**

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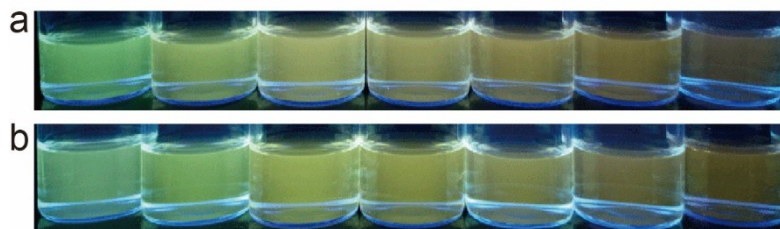
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**Fig. S1** The initial fluorescent images of Acr<sup>+</sup>-Mes in different solvents under 365 nm ultraviolet excitation.



**Fig. S2** The initial optical images of binary solvent mixtures with different volume ratios (left to right: 100:0, 80:20, 60:40, 50:50, 40:60, 20:80, and 0:100) under 365 nm ultraviolet excitation: a) DCM and MeCN, b) TCM and MeCN.

**Table S1.** Training matrix of the response patterns against various solvents based on RGB values.

Solvents	R	G	B
H <sub>2</sub> O	58	129	86
H <sub>2</sub> O	62	126	89
H <sub>2</sub> O	58	129	99
H <sub>2</sub> O	56	120	96
H <sub>2</sub> O	60	121	87
EtOH	61	166	100
EtOH	60	167	97
EtOH	61	170	103
EtOH	63	165	99
EtOH	57	167	96
MeCN	171	164	120
MeCN	177	159	119
MeCN	172	160	120
MeCN	172	155	112
MeCN	170	155	112
DMSO	14	22	41
DMSO	10	21	43

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DMSO	10	21	41
DMSO	15	21	47
DMSO	11	18	44
CO(Me) <sub>2</sub>	133	128	88
CO(Me) <sub>2</sub>	131	128	83
CO(Me) <sub>2</sub>	132	129	88
CO(Me) <sub>2</sub>	130	124	88
CO(Me) <sub>2</sub>	127	123	86
DCM	166	209	130
DCM	161	206	125
DCM	169	209	123
DCM	166	205	124
DCM	167	208	129
TCM	106	175	120
TCM	108	179	121
TCM	109	180	120
TCM	111	180	125
TCM	106	180	119
THF	84	162	104
THF	82	157	100

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THF	81	159	101
THF	85	160	101
THF	84	160	98
PhMe	38	164	179
PhMe	41	167	181
PhMe	32	159	174
PhMe	39	166	183
PhMe	36	162	177
CCl <sub>4</sub>	0	94	224
CCl <sub>4</sub>	2	94	227
CCl <sub>4</sub>	3	98	228
CCl <sub>4</sub>	0	92	226
CCl <sub>4</sub>	0	93	227

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**Table S2.** Identification of unknown samples

Sample no.	R	G	B	Identification	Verification
1	176	162	117	MeCN	Yes
2	107	176	119	TCM	Yes
3	85	163	103	THF	Yes
4	165	207	131	DCM	Yes
5	1	94	223	CCl <sub>4</sub>	Yes
6	2	90	223	CCl <sub>4</sub>	Yes
7	14	21	47	DMSO	Yes
8	172	157	116	MeCN	Yes
9	42	165	183	PhMe	Yes
10	129	124	86	CO(Me) <sub>2</sub>	Yes
11	42	163	182	PhMe	Yes
12	62	125	94	H <sub>2</sub> O	Yes
13	9	21	45	DMSO	Yes
14	175	158	115	MeCN	Yes
15	55	168	104	EtOH	Yes
16	165	210	127	DCM	Yes
17	164	208	133	DCM	Yes
18	40	159	181	PhMe	Yes

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19	3	91	224	CCl <sub>4</sub>	Yes
20	111	180	125	TCM	Yes
21	60	169	102	EtOH	Yes
22	43	160	180	PhMe	Yes
23	87	160	105	THF	Yes
24	81	158	102	THF	Yes
25	107	177	117	TCM	Yes
26	132	127	89	CO(Me) <sub>2</sub>	Yes
27	62	167	101	EtOH	Yes
28	170	165	115	MeCN	Yes
29	39	160	177	PhMe	Yes
30	124	125	83	CO(Me) <sub>2</sub>	Yes
31	160	203	123	DCM	Yes
32	59	170	102	EtOH	Yes
33	109	179	119	TCM	Yes
34	54	120	92	H <sub>2</sub> O	Yes
35	135	130	90	CO(Me) <sub>2</sub>	Yes
36	82	159	103	THF	Yes
37	12	24	46	DMSO	Yes
38	173	160	118	MeCN	Yes

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39	2	95	226	CCl <sub>4</sub>	Yes
40	58	167	102	EtOH	Yes
41	57	126	97	H <sub>2</sub> O	Yes
42	165	210	129	DCM	Yes
43	11	21	46	DMSO	Yes
44	108	178	116	TCM	Yes
45	128	124	87	CO(Me) <sub>2</sub>	Yes
46	45	161	184	PhMe	Yes
47	57	116	88	H <sub>2</sub> O	Yes
48	84	161	107	THF	Yes
49	175	163	123	MeCN	Yes
50	12	21	50	DMSO	Yes
51	58	122	96	H <sub>2</sub> O	Yes
52	64	123	91	H <sub>2</sub> O	Yes
53	178	164	125	MeCN	Yes
54	2	97	227	CCl <sub>4</sub>	Yes
55	114	183	126	TCM	Yes
56	132	124	87	CO(Me) <sub>2</sub>	Yes
57	41	162	181	PhMe	Yes
58	106	177	117	TCM	Yes

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59	60	166	100	EtOH	Yes
60	1	94	225	CCl <sub>4</sub>	Yes
61	10	25	48	DMSO	Yes
62	165	209	132	DCM	Yes
63	84	161	105	THF	Yes
64	55	124	95	H <sub>2</sub> O	Yes
65	43	169	183	PhMe	Yes
66	161	205	128	DCM	Yes
67	80	164	104	THF	Yes
68	1	93	226	CCl <sub>4</sub>	Yes
69	109	183	124	TCM	Yes
70	56	164	102	EtOH	Yes
71	61	166	107	EtOH	Yes
72	163	212	131	DCM	Yes
73	128	120	83	CO(Me) <sub>2</sub>	Yes
74	175	159	125	MeCN	Yes
75	2	95	226	CCl <sub>4</sub>	Yes
76	62	129	98	H <sub>2</sub> O	Yes
77	111	180	126	TCM	Yes
78	129	123	87	CO(Me) <sub>2</sub>	Yes

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79	13	25	47	DMSO	Yes
80	43	173	186	PhMe	Yes
81	12	23	43	DMSO	Yes
82	83	158	99	THF	Yes
83	177	159	119	MeCN	Yes
84	136	122	87	CO(Me) <sub>2</sub>	Yes
85	166	210	133	DCM	Yes
86	86	164	104	THF	Yes
87	62	125	98	H <sub>2</sub> O	Yes
88	111	182	124	TCM	Yes
89	0	91	224	CCl <sub>4</sub>	Yes
90	60	123	92	H <sub>2</sub> O	Yes
91	55	166	100	EtOH	Yes
92	170	157	113	MeCN	Yes
93	10	18	51	DMSO	Yes
94	43	169	184	PhMe	Yes
95	79	161	99	THF	Yes
96	55	164	97	EtOH	Yes
97	134	120	81	CO(Me) <sub>2</sub>	Yes
98	0	94	225	CCl <sub>4</sub>	Yes

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99	163	207	130	DCM	Yes
100	13	20	48	DMSO	Yes

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