Supporting Information for:

Versatile Hydrochromic Fluorescent Materials Based on a 1,8-Naphthalimide Integrated Fluorophore-Receptor System

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1. NMR Spectroscopic Characterization Data



Figure S2. ¹³C NMR spectrum of 1·Br in CDCl₃ at 298K (101 MHz)



Figure S4. ¹³C NMR spectrum of 2·Br in CDCl₃ at 298K (101 MHz)





Figure S5. High resolution mass spectra of 1.Br



Figure S6. High resolution mass spectra of 2.Br

3. Photophysical Characteristics of 1·Br and 2·Br in Solution



Figure S7. a) Photographs of vials under irradiation with 365 nm light containing a 0.1 mM solution of $1 \cdot Br$ (top) and $2 \cdot Br$ (bottom) in various solvents. Overlaid UV-Vis absorption and emission spectra of 1×10^{-4} M solutions of $1 \cdot Br$ and $2 \cdot Br$ in b) water, c) methanol, d) dimethylformamide, e) acetonitrile, f) ethanol, g) tetrahydrofuran, and h) dichloromethane.

4. Photophysical Characteristics of 1·Br and 2·Br in the Solid State



Figure S8. Emission spectra of 1×10^{-4} M aqueous solutions of 1·Br and 2·Br that has undergone a-b) aggregation with the addition of NaCl and which have been frozen c-d).



Figure S9. Overlaid emission spectra of powder samples of $1 \cdot Br$ and $2 \cdot Br$ as a function of a) and c) increasing relative humidity from 0 to 90 % and as a function of b) and d) decreasing relative humidity from 80 to 10%.



Figure S10. Overlaid emission spectra of agar-based aerogel samples containing $1 \cdot Br$ and $2 \cdot Br$ as a function of a) and c) increasing relative humidity from 0 to 90 % and as a function of b) and d) decreasing relative humidity from 80 to 10%.

5. Dynamic Vapor Sorption (DVS) Tables

$1 \cdot Br$ Powder

RH (%)	Water Absorption (Wt %)
0	0
10	0.22
20	0.37
30	0.49
40	0.58
50	0.67
60	0.77
70	0.86
80	0.98
90	1.35
80	1.08
70	0.91
60	0.81
50	0.72
40	0.63
30	0.53
20	0.41
10	0.26

$2 \cdot Br$ Powder

RH (%)	Water Absorption (Wt %)
0	0
10	0.18
20	0.42
30	0.76
40	1.15
50	1.52
60	1.85
70	2.17
80	2.59
90	3.77
80	2.70
70	2.28
60	1.95
50	1.62
40	1.26
30	0.87
20	0.51
10	0.25

Table S1. Weight % water adsorption and desorption as a function of increasing and decreasing relative humidity measured using dynamic vapor sorption gravimetry at 298 K for powder samples of $1 \cdot Br$ and $2 \cdot Br$.

1-Br Aerogel

$2 \cdot Br$ Aerogel	
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RH (%)	Water Absorption (Wt %)
0	0
10	3.90
20	6.84
30	9.31
40	11.35
50	13.21
60	15.14
70	17.51
80	20.95
90	26.96
80	22.42
70	19.78
60	17.80
50	15.95
40	14.29
30	12.66
20	10.76
10	7.89

RH (%)	Water Absorption (Wt %)
0	0
10	3.82
20	6.77
30	9.20
40	11.18
50	12.97
60	14.85
70	17.12
80	20.57
90	26.63
80	22.06
70	19.40
60	17.36
50	15.51
40	13.85
30	12.22
20	10.33
10	7.47

Table S2. Weight % water adsorption and desorption as a function of increasing and
decreasing relative humidity measured using dynamic vapor sorption gravimetry at 298 K for
agar-based aerogel samples containing $1 \cdot Br$ and $2 \cdot Br$.





Figure S11. Photographs of spin coated films containing $1 \cdot Br$ (top) and $2 \cdot Br$ (bottom) under visible light (left) and irradiated with 365 nm light while dry (middle) and after having been exposed to 90 % RH for 30 minutes.



Figure S12. Photographs of agar-based aerogels containing $1 \cdot Br$ (top) and $2 \cdot Br$ (bottom) under visible light (left) and irradiated with 365 nm light while dry (middle) and after having been exposed to 90 % RH for 30 minutes.



Figure S13. Photographs of silica gel/carboxymethyl cellulose films containing $1 \cdot Br$ (top) and $2 \cdot Br$ (bottom) under visible light (left) and irradiated with 365 nm light while dry (middle, left), after having been exposed to 90 % RH for 30 minutes (middle, right), and after having been lightly airbrushed with water (right).



Figure S14. Photographs of silica gel/carboxymethyl cellulose films containing $1 \cdot Br$ (top) and $2 \cdot Br$ (bottom) under irradiation with 365 nm light after having had a drop a various solvents adsorbed onto the film.



Figure S15. Photographs of fluorescent hydrochromic inkjet printed images containing 1·Br (top) and 2·Br (bottom) under visible light (left) and irradiated with 365 nm light while dry (middle) and after having been exposed to 92 % RH overnight (right). Dragon image reprinted with permission from © Anan Punyod | Dreamstime.com.