Electronic Supplementary Information (ESI)

Systematic Investigation on the Coordination Chemistry of a Sulfonated Monoazo Dye: Ligand Dominated d- and f-Block Derivatives

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Table S1 Hydrogen bond lengths (Å) for compounds **1**-**5**.

Compound 1			
N(1)-H(4A)···O(1)W	2.792	N(4)-H(4E)···O(4)W	2.753
$O(2)_W$-H(1D)···O(2)	2.844	$O(2)_W$-H(1C)···O(6)	2.876
$O(3)_W$-H(1E)···O(3)	2.914	$O(2)_W$-H(1H)···O(5)	2.846
Compound 2			
N(4)-H(1X)···O(1)	3.024	N(4)-H(1F)···O(1)W	2.804
N(4)-H(1C)···O(5)	2.930	$O(1)_W$-H(1E)···O(6)	2.722
$O(2)_W$-H(1I)···O(4)	2.838	$O(1)_W$-H(1D)···O(4)	2.893
Compound 3a			
$O(1)_W$-H···O(2)	2.740	$O(1)_W$-H···O(3)	2.744
N(1)-H···O(2)	3.087		
Compound 3b			
$O(1)_W$-H···O(1)	2.740	$O(1)_W$-H···O(2)	2.759
N(1)-H···O(3)	3.046		
Compound 3c			
$O(1)_W$-H···O(2)	2.776	$O(1)_W$-H···O(3)	2.672
N(1)-H···O(3)	3.031		
Compound 3d			
$O(1)_W$-H···O(2)	2.734	$O(1)_W$-H···O(3)	2.767
N(1)-H···O(2)	3.098		
Compound 3e			
$O(1)_W$-H···O(1)	2.742	$O(1)_W$-H···O(2)	2.733
N(1)-H···O(2)	3.066		
Compound 3f			
$O(1)_W$-H···O(2)	2.771	$O(1)_W$-H···O(3)	2.719
N(1)-H···O(2)	3.024		
Compound 5a			
$O(3)_W$-H···O(9)	2.840	$O(3)_W$-H···O(2)	2.950
$O(2)_W$-H···O(3)	2.837	$O(1)_W$-H···$O(2)_W$	2.688
$O(1)_W$-H···O(5)	2.731	$O(2)_W$-H···O(6)	2.788
Compound 5c			
$O(3)_W$-H···O(5)	2.901	$O(3)_W$-H···O(8)	2.852
$O(1)_W$-H···O(2)	2.753	$O(1)_W$-H···$O(4)_W$	2.659
$O(4)_W$-H···O(3)	2.770	$O(4)_W$-H···O(6)	2.846

Fig. S1 XRPD patterns of complexes La/Pr/Nd/Sm-L, showing the identical characteristics of the samples.

Fig. S2 Simulated and experimental XRPD patterns of **5c**, and a comparison of experimental XRPD patterns of **5b** and **5c**.

Fig. S3 IR spectra on CaF_2 slides of PEI-BW_{12} (a), PEI-BW_{12}/**5c**-**Ho** (b), and PEI-(PW_{12}/**5c**-**Ho**)$_6$ (c).

Fig. S4 AFM images of **5c** on mica slide.

Fig. S5 UV-vis spectra of the PEI-(PEG/**5c**-**Ho**)$_n$ multilayer films on a quartz slide.

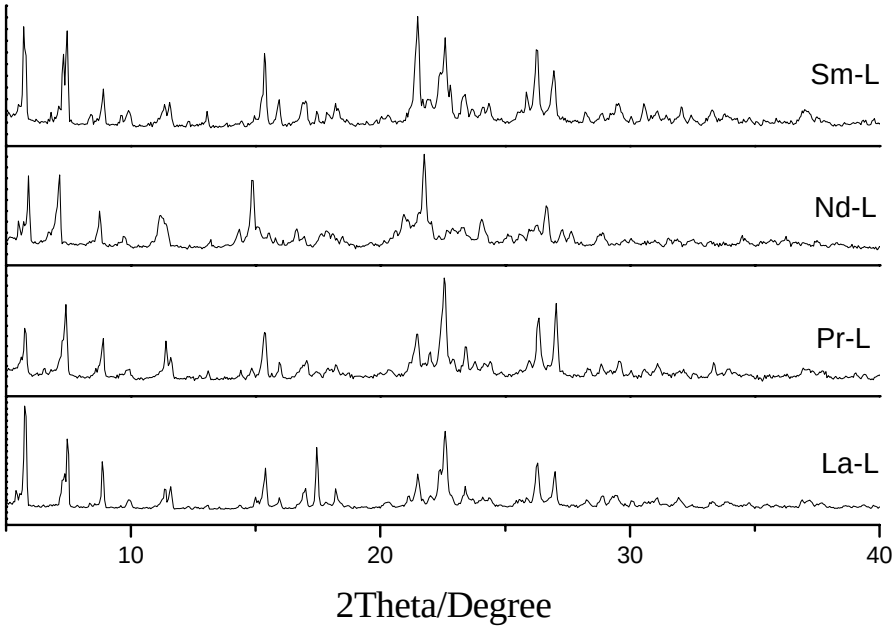

Fig. S1

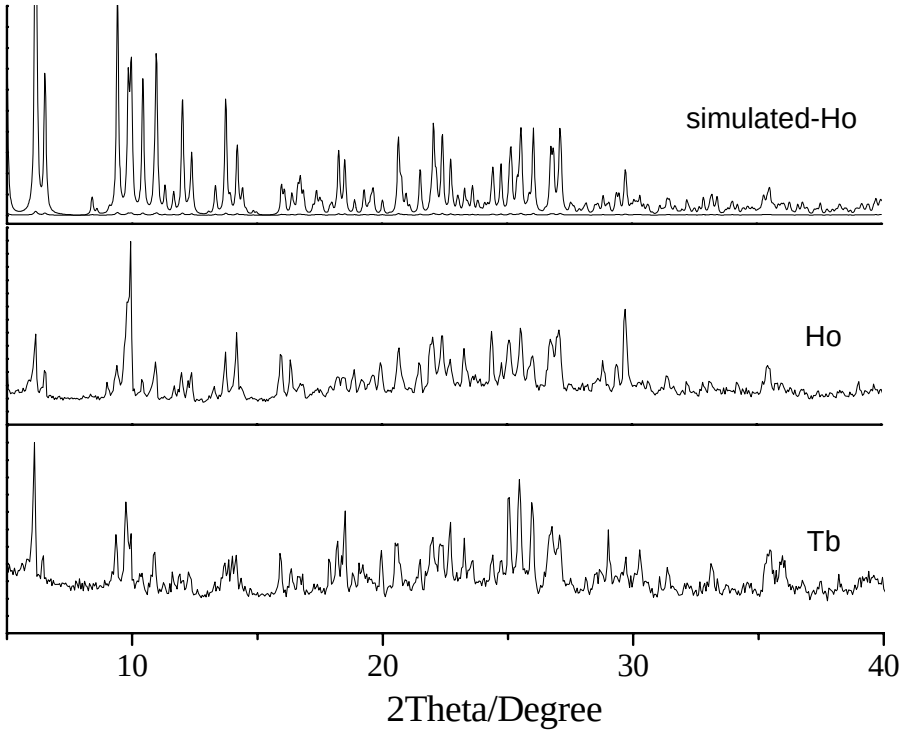

Fig. S2

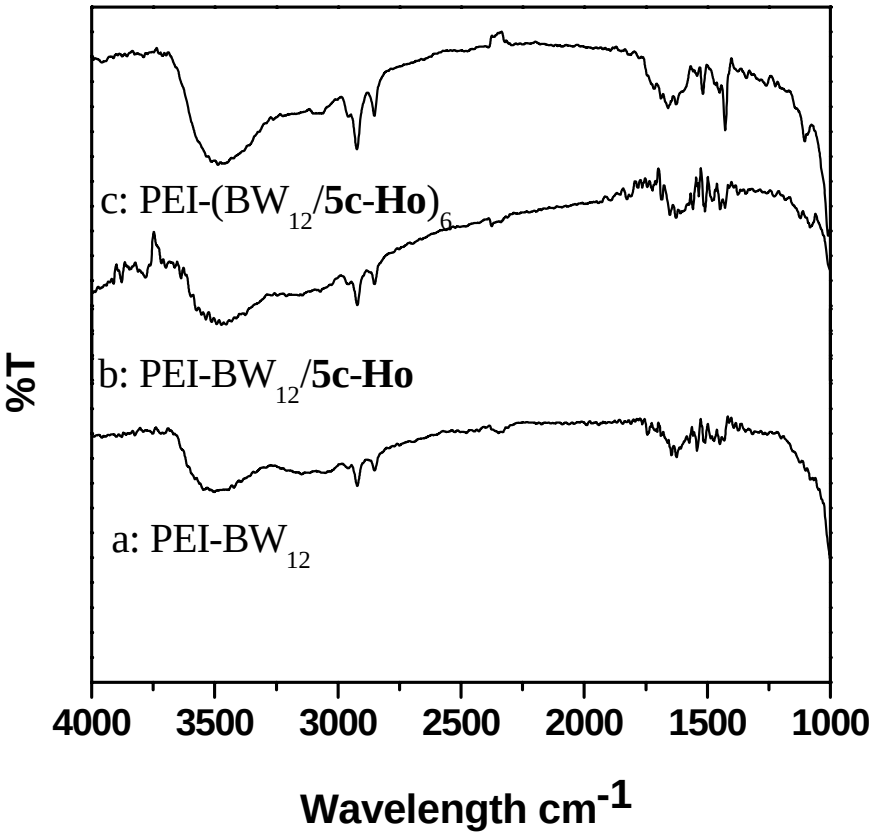

Fig. S3

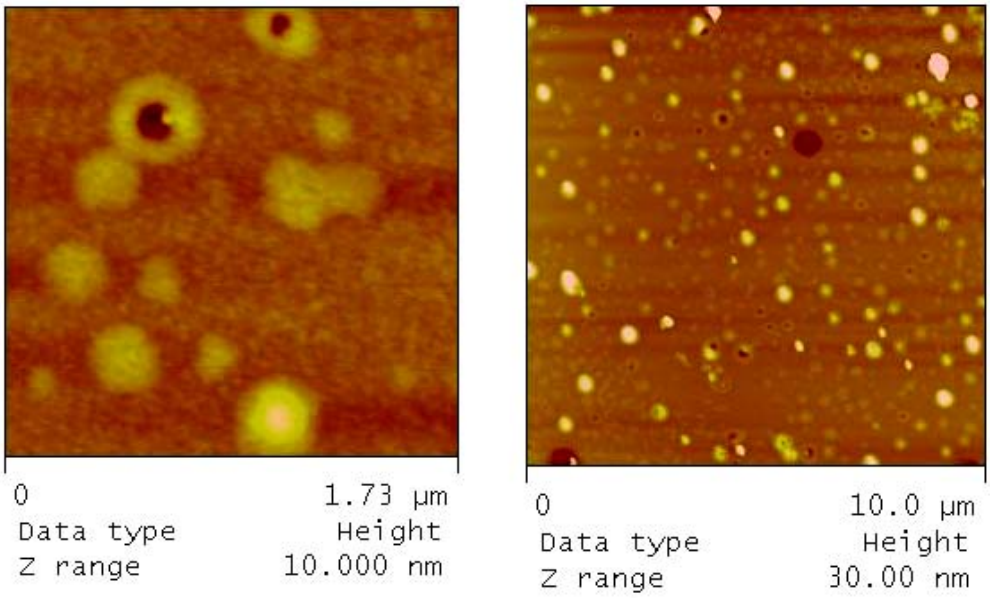

Fig. S4

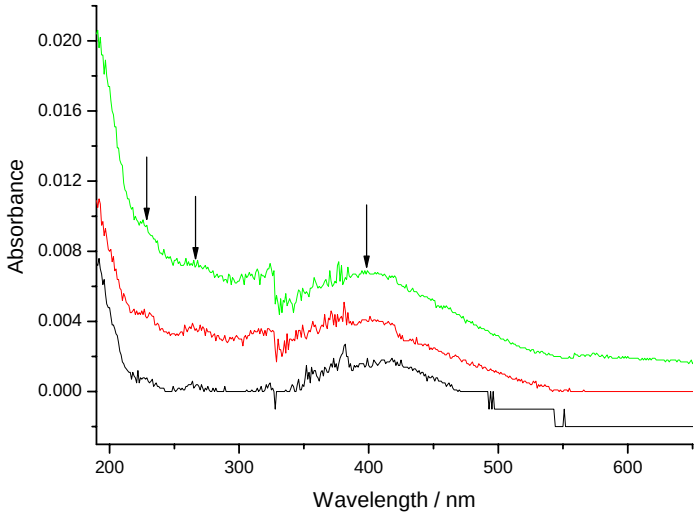

Fig. S5