Long-wavelength Near-infrared of Ni^{2+}-doped Double Perovskite Molybdate-based Solid-solution Phosphors

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Table S1. Crystallographic parameters obtained from XRD *Rietveld* refinement of SBMMO-x (x= 1, 2, 3, 4 and 5) solid-solution phosphors, respectively.

	SBMMO-1	SBMMO-2	SBMMO-3	SBMMO-4	SBMMO-5
Crystal structure	Tetragonal	Tetragonal	Tetragonal	Tetragonal	Cubic
Space group	*I4/m*	*I4/m*	*I4/m*	*I4/m*	*Pm-3m*
a, Å	7.849	7.832	7.820	7.802	8.074
b, Å	7.849	7.832	7.820	7.802	8.074
c, Å	7.917	7.931	7.944	7.973	8.074
V, $Å^3$	487.741	486.489	485.794	485.326	526.339
R_p%	6.56	5.77	7.82	8.46	7.01
R_{wp}%	5.73	6.24	6.38	9.47	6.16
χ^2%	3.14	2.76	2.99	2.51	2.97

Table S2. Calculated crystal field parameters obtained from optical spectra of SBMMO-x (x= 1, 2, 3, 4 and 5) solid-solution phosphors, respectively.

	SBMMO-1	SBMMO-2	SBMMO-3	SBMMO-4	SBMMO-5
$^3A_2(F) \rightarrow {}^3T_1(P)$, nm	384	386	390	391	395
$^3A_2(F) \rightarrow {}^3T_2(F)$, nm	1158	1182	1226	1270	1370
v_3, cm^{-1}	26041.66	25906.73	25641.02	25575	25316.45
v_1, cm^{-1}	8635.57	8460.23	8156.6	7874.01	7299.27
D_q, cm^{-1}	863.557	846.023	815.66	787.4	729.927
B, cm^{-1}	969.498	978.799	992.118	1017.07	1057.35
D_q/B	0.8907	0.8643	0.8221	0.7741	0.6903

Figure S1. Rietveld refinement profiles of (a) SBMMO-2, (b) SBMMO-3, (c) SBMMO-4, and (d) SBMMO-5, respectively.

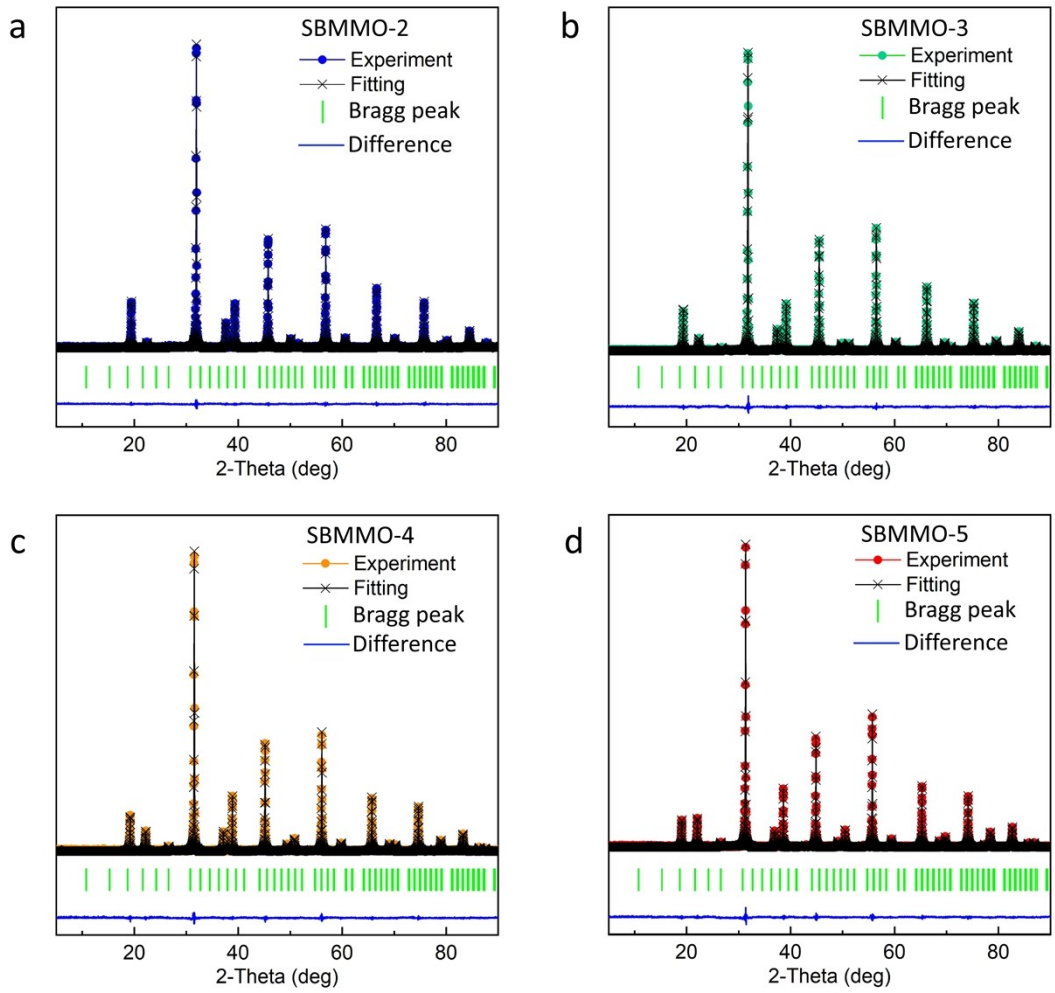

Figure S2. The plot of absorption coefficient against photon energy for non-doping SBMMO-x (x= 1, 2, 3, 4 and 5) host.

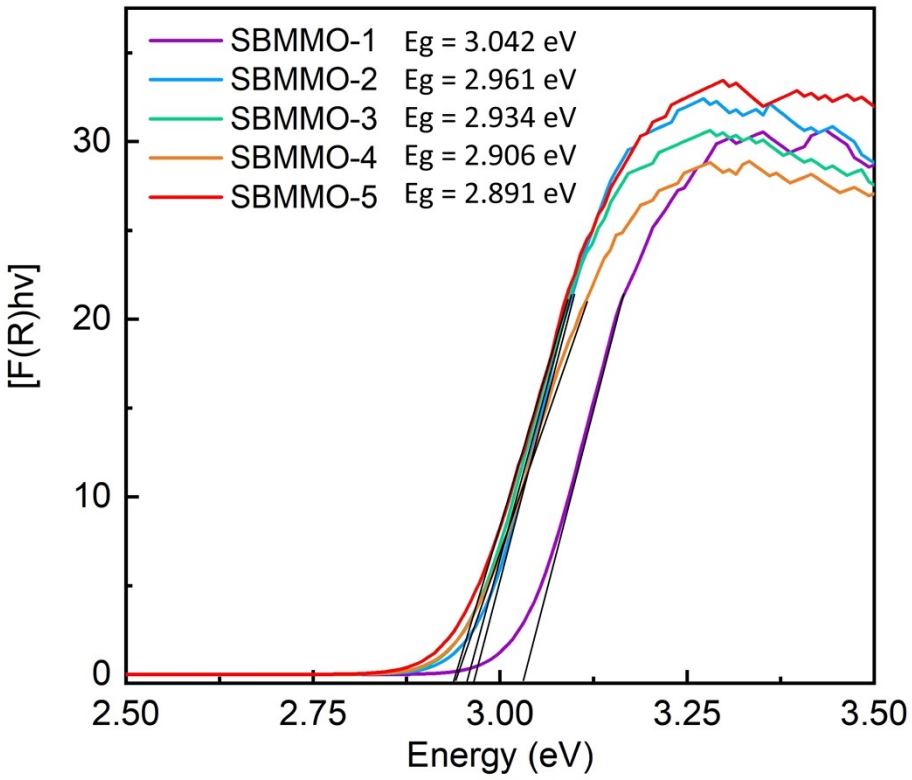

Figure S3. The Arrhenius plot of Ln(I/I_0-1) versus 1/K_BT of of SBMMO-x (x= 1, 2, 3, 4 and 5) solid-solution phosphors, respectively.