Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Non-quenching photoluminescence emission up to at least 865 K upon near-UV excitation in a single crystal of orange-red emitting $SmPO_4$

(Supplementary information)

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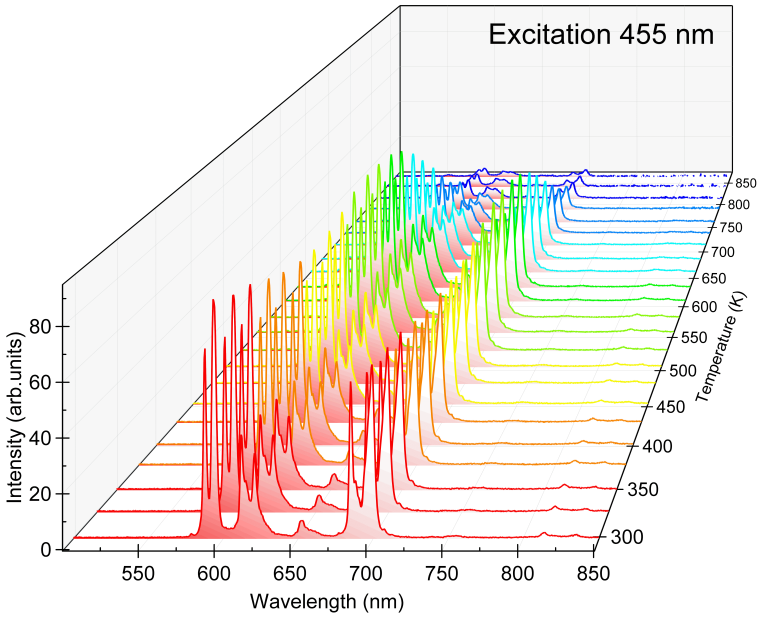

Fig. S1 The temperature dependent PL emission spectra for $EuPO_4$ single crystal sample upon excitation at a wavelength, 455 nm.

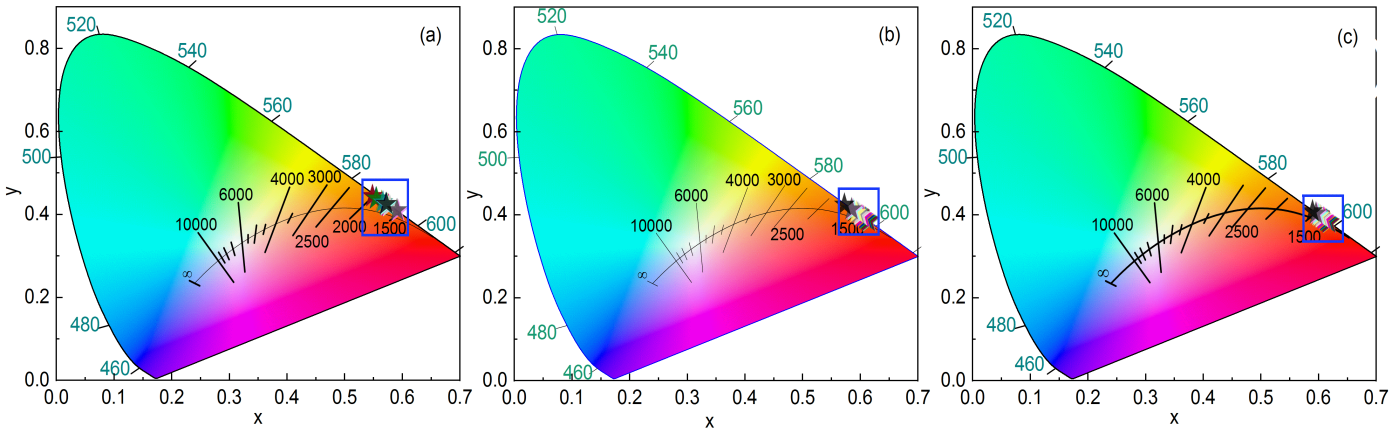

Fig. S2 The CIE coordinate diagram for, (a) $SmPO_4$ (exc. 455 nm), (b) $EuPO_4$ (exc. 365 nm), and (c) $EuPO_4$ (exc. 455 nm).

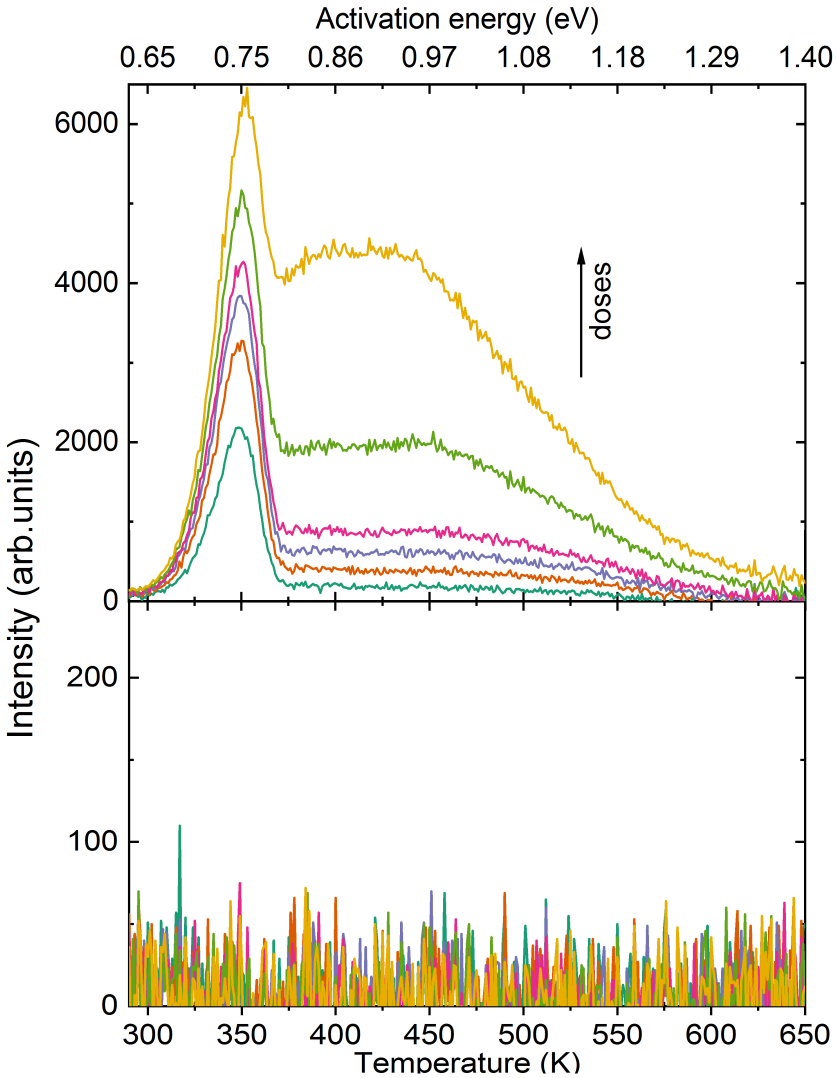

Fig. S3 TL glow curves for $EuPO_4$ sample as a function of increasing β–dose measured with a Hoya U–340 filter (upper panel), and with a SJF–600 filter (lower panel).

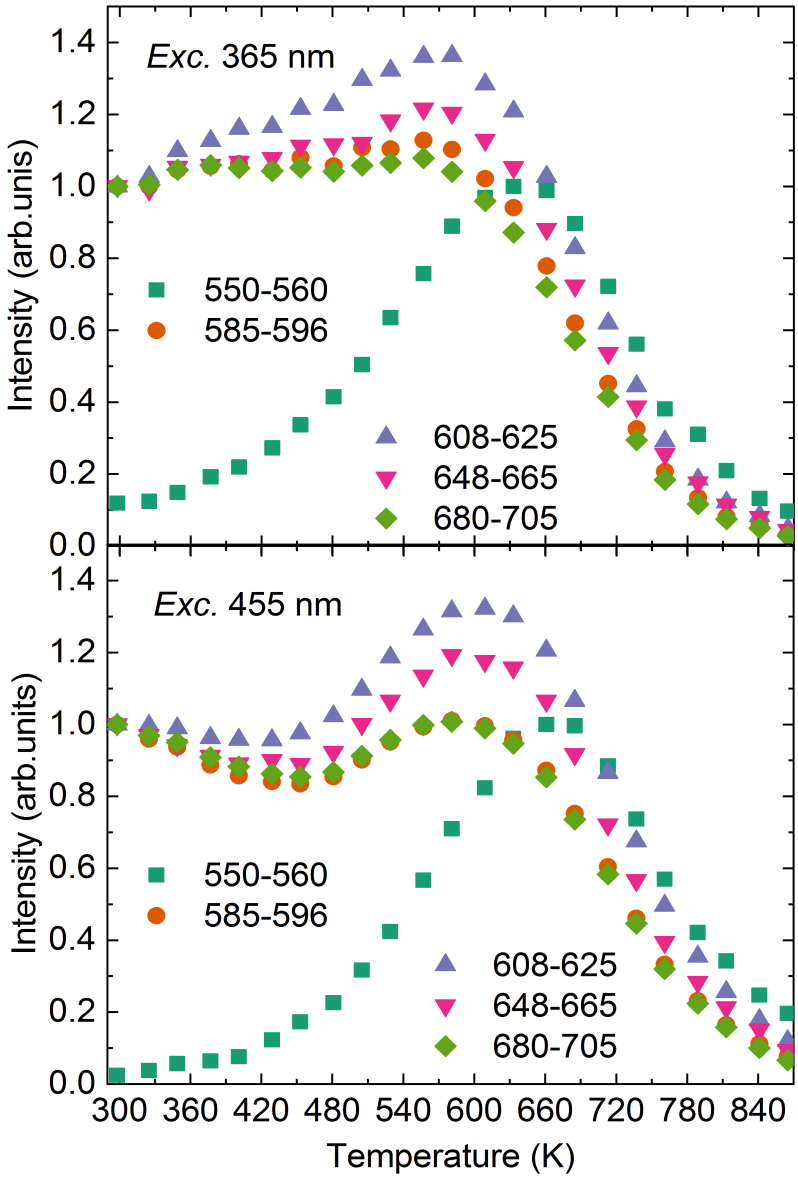

Fig. S4 The integrated emission intensities for individual emission bands of $EuPO_4$ for excitation at 365 and 455 nm.

Table S1 The variation in the x,y coordinates, color purity, and CCT temperature for a single crystal sample of $SmPO_4$, for excitation at wavelengths, 365 and 455 nm, in the wide temperature range, 293–865 K.

Temperature (K)	x	y	color purity (%)	CCT (K)	x	y	color purity (%)	CCT (K)
Exc. 365 nm					**Exc. 455 nm**			
293	0.58997	0.40782	65.59	1549	0.57124	0.42366	62.46	1739
325	0.58849	0.40898	65.32	1563	0.57275	0.42231	62.69	1722
349	0.58825	0.40923	65.28	1565	0.57397	0.42124	62.88	1709
377	0.58842	0.40935	65.33	1565	0.57519	0.42063	63.11	1699
401	0.58747	0.40993	65.15	1573	0.57207	0.42311	62.60	1731
429	0.58741	0.41025	65.16	1575	0.56408	0.42993	61.40	1819
453	0.58661	0.41078	65.01	1582	0.55449	0.43829	60.08	1932
481	0.58571	0.41183	64.87	1592	0.54851	0.44345	59.33	2006
505	0.58490	0.41259	64.74	1601	0.54808	0.44436	59.34	2015
529	0.58450	0.41334	64.70	1607	0.55527	0.43818	60.25	1926
557	0.58389	0.41409	64.61	1614	0.56645	0.42881	61.83	1797
581	0.58322	0.41452	64.49	1620	0.57163	0.42423	62.60	1740
609	0.58262	0.41541	64.42	1628	0.57519	0.42211	63.23	1706
633	0.58119	0.41668	64.18	1643	0.57648	0.42016	63.37	1688
661	0.58026	0.41733	64.02	1651	0.57604	0.42045	63.29	1693
685	0.57938	0.41821	63.88	1661	0.57757	0.41955	63.57	1679
713	0.57860	0.41902	63.77	1670	0.57844	0.41955	63.77	1673
737	0.57724	0.42004	63.53	1683	0.57462	0.42187	63.08	1709
761	0.57639	0.42088	63.41	1693	0.57423	0.42304	63.09	1717
789	0.57487	0.42227	63.17	1709	0.57364	0.42225	62.89	1717
813	0.57113	0.42473	62.53	1745	0.59310	0.40733	66.29	1530
841	0.57107	0.42566	62.60	1751	0.59078	0.40988	65.92	1555
865	0.56461	0.43105	61.62	1822	0.57248	0.42502	62.86	1738

Table S2 The variation in the x,y coordinates, color purity, and CCT temperature for a single crystal sample of $EuPO_4$, for excitation at wavelengths, 365 and 455 nm, in the wide temperature range, 293–865 K.

Temperature (K)	x	y	color purity (%)	CCT (K)	x	y	color purity (%)	CCT (K)
Exc. 365 nm					**Exc. 455 nm**			
293	0.61541	0.38392	70.34	1313	0.61884	0.38062	71.03	1283
325	0.61603	0.38337	70.46	1308	0.61886	0.38055	71.03	1283
349	0.61597	0.3834	70.45	1308	0.61888	0.38057	71.04	1283
377	0.61558	0.38378	70.37	1312	0.61934	0.38011	71.13	1279
401	0.61562	0.38373	70.38	1311	0.61944	0.38004	71.15	1278
429	0.61522	0.38415	70.30	1315	0.61878	0.38065	71.01	1284
453	0.61434	0.38499	70.12	1323	0.61853	0.38094	70.97	1286
481	0.61379	0.38548	70.01	1327	0.61784	0.38155	70.82	1292
505	0.61271	0.38651	69.80	1337	0.61700	0.38240	70.66	1299
529	0.61137	0.38782	69.54	1349	0.61570	0.38364	70.39	1310
557	0.60988	0.38925	69.25	1362	0.61445	0.38486	70.15	1321
581	0.60853	0.39056	68.99	1374	0.61329	0.38597	69.92	1332
609	0.60658	0.39243	68.62	1392	0.61189	0.38736	69.64	1344
633	0.60485	0.39409	68.29	1408	0.60986	0.38931	69.25	1362
661	0.60276	0.39606	67.90	1427	0.60837	0.39072	68.96	1376
685	0.60062	0.39811	67.50	1447	0.60638	0.39265	68.58	1394
713	0.59917	0.39948	67.24	1461	0.60506	0.39398	68.33	1406
737	0.59584	0.40277	66.65	1494	0.60280	0.39599	67.90	1427
761	0.59337	0.40509	66.21	1518	0.60197	0.39697	67.76	1435
789	0.58846	0.40969	65.36	1567	0.60006	0.39863	67.40	1453
813	0.58595	0.41135	64.89	1589	0.59714	0.40130	66.86	1480
841	0.58486	0.41299	64.76	1603	0.59555	0.40282	66.58	1495
865	0.57241	0.42420	62.77	1734	0.58965	0.40825	65.54	1553