†Electronic supplementary information (ESI)

Luminescence properties of Tb^{3+} doped $CaMoO_4$ nanoparticles: Annealing effect, polar medium dispersible, polymer film and core-shell formation

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Table S1: Parameters obtained after mono-exponential equation fitting to decay data of as-prepared, 500 and 900 ^{o}C annealed samples at 250 and 355 nm excitation.

Sample	Excitation λ (nm)	Tb^{3+} (at.%)	I_1 (%)	τ_1 (μs)	χ^2
as-prepared	250	1	14017	877	7.336
		3	19904	709	6.729
		5	16404	570	11.487
		10	14395	519	12.409
		20	3901	423	27.433
	355	1	148	744	2.487
		3	759	705	2.538
		5	698	485	2.334
		10	1020	224	2.698
		20	6132	28	1.305
500 ^{o}C	250	1	13001	893	14.574
		3	16529	509	20.128
		5	17523	308	12.084
		10	14764	329	13.065
		20	13739	174	9.359
	355	1	201	900	2.992
		3	604	475	3.291
		5	942	291	2.711
		10	850	280	2.881
		20	1572	94	3.819
900 ^{o}C	250	1	1799	809	12.704
		3	29120	627	1.792
		5	29932	602	1.736
		10	29413	587	1.625
		20	25459	218	9.906
	355	1	388	1000	4.426
		3	8770	703	1.444
		5	8990	696	1.267
		10	8491	689	1.336
		20	9576	186	1.279

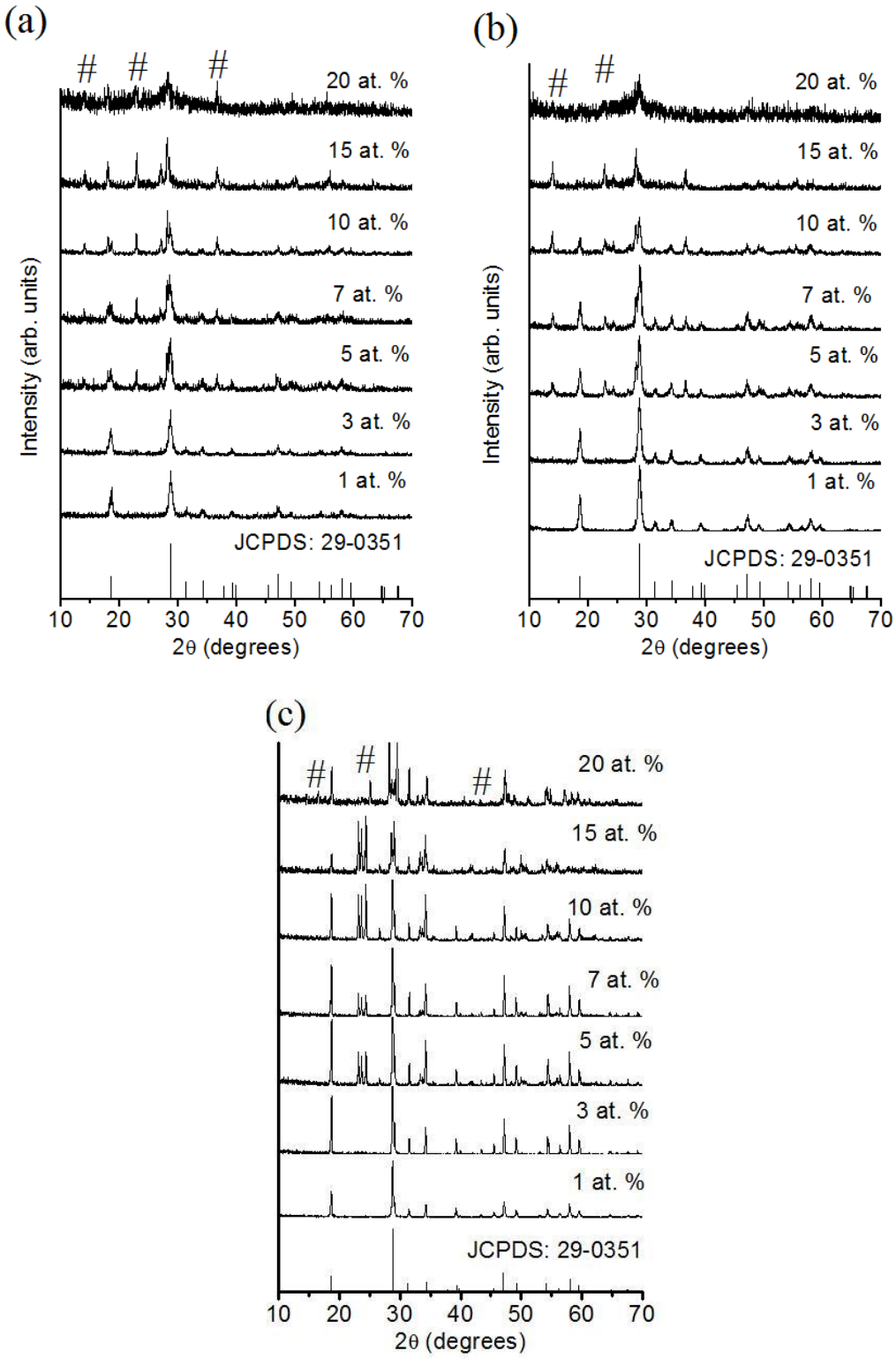

Fig. S1 XRD patterns of (a) as-prepared, (b) 500 and (c) 900 ^{o}C samples of $CaMoO_4$ doped with Tb^{3+}. Atomic percentage of Tb^{3+} is given in figure itself. The symbol # represents the extra phase evolution.

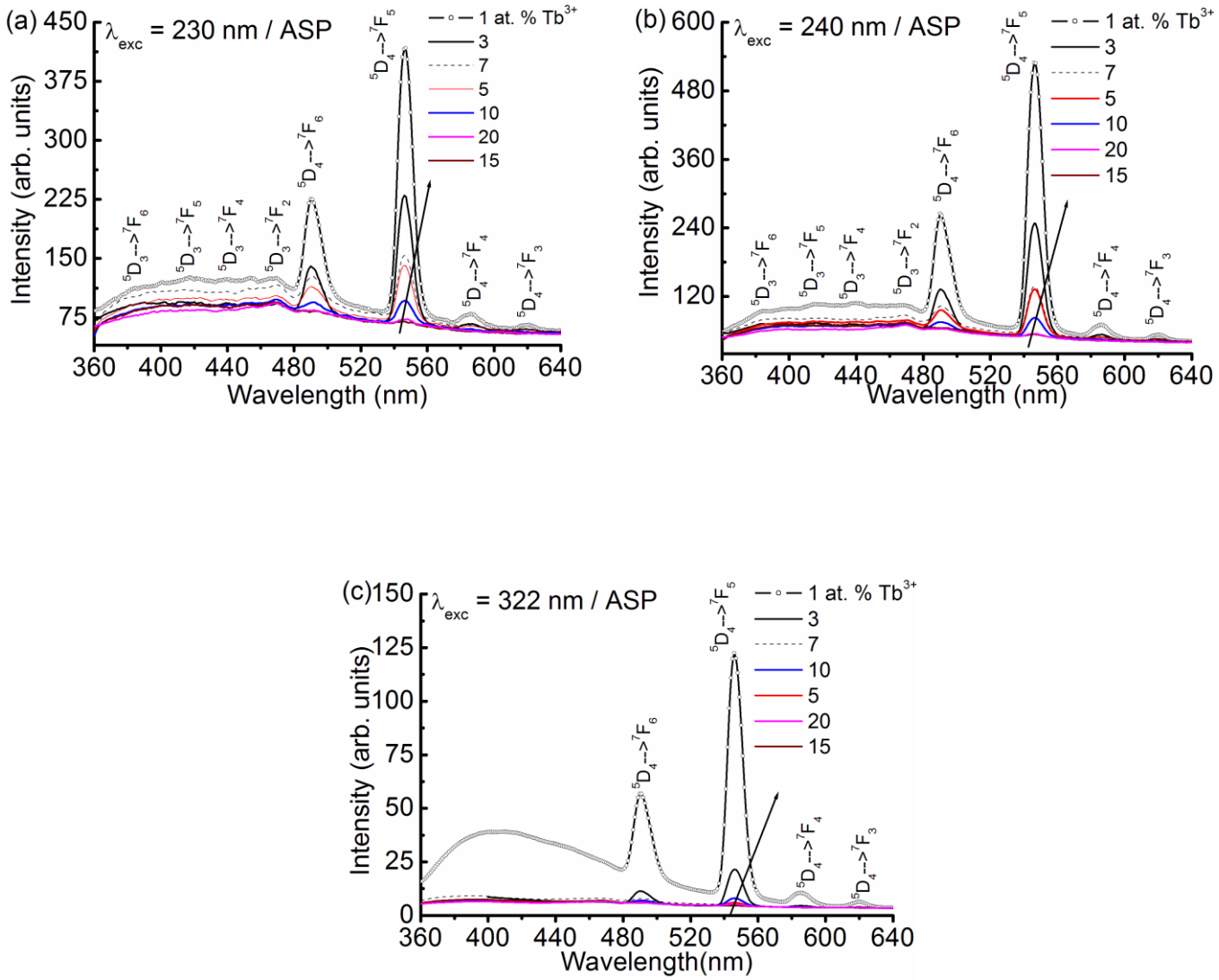

Fig. S2 Luminescence spectra of as-prepared $CaMoO_4:Tb^{3+}$ (Tb^{3+} = 1, 3, 5, 7, 10, 15 and 20 at.%) nanoparticles at (a) 230, (b) 240 and (c) 322 nm excitation.

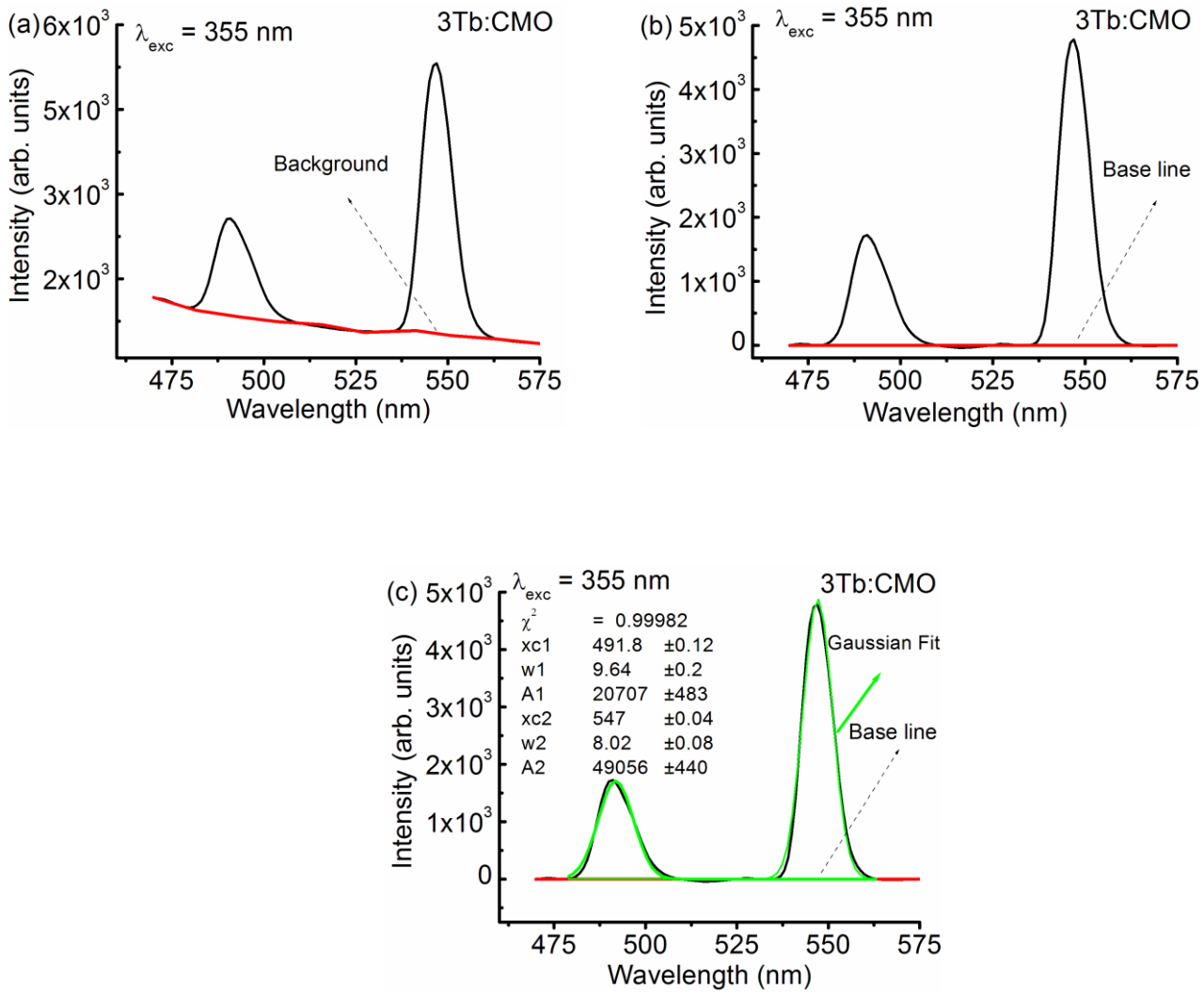

Fig. S3 The typical fitting of $^5D_4 \rightarrow {}^7F_6$ and $^5D_4 \rightarrow {}^7F_5$ transitions of 3 at.% Tb^{3+} doped $CaMoO_4$ annealed at 900 °C under 355 nm excitation.

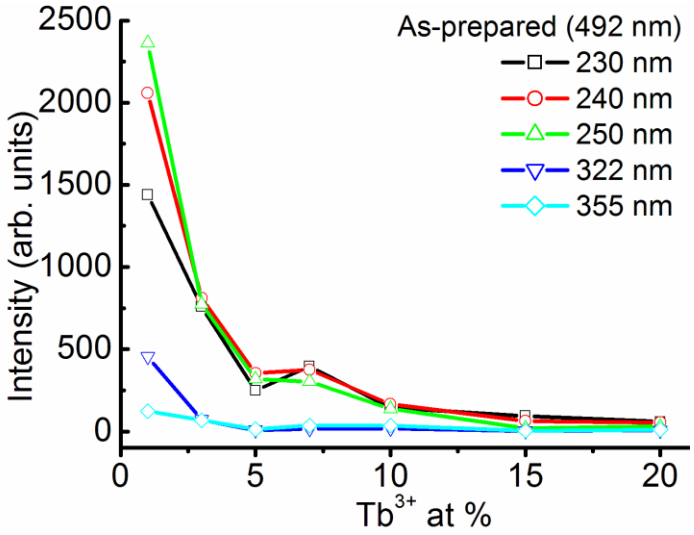

Fig. S4 The change in emission intensity of $^5D_4 \rightarrow {}^7F_6$ transition (492 nm) of as-prepared Tb^{3+} doped $CaMoO_4$ nanoparticles (Tb^{3+} =1, 3, 5, 7, 10, 15 and 20 at.%) at different excitation wavelengths.

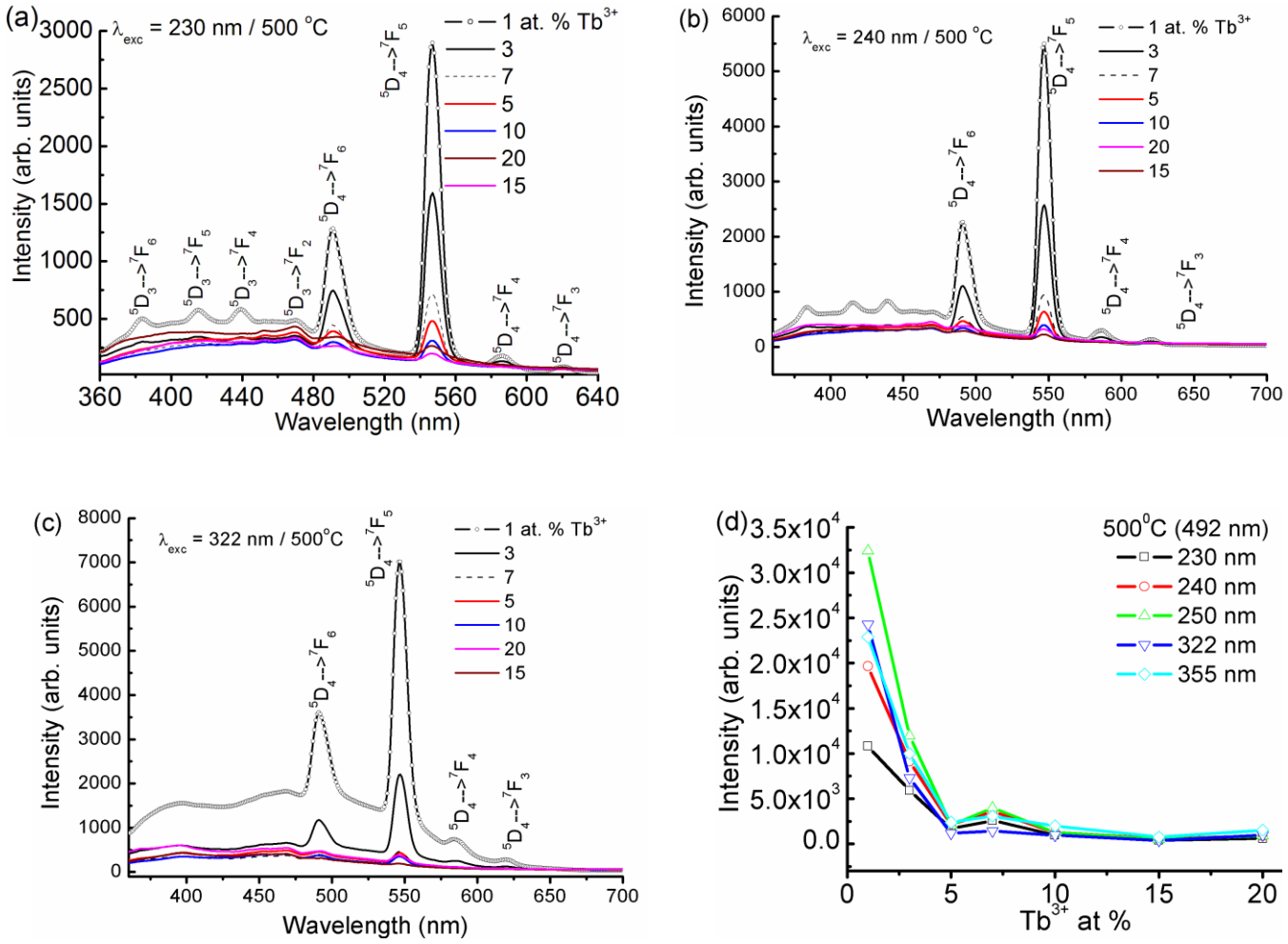

Fig. S5 Luminescence spectra of 500 °C annealed $CaMoO_4:Tb^{3+}$ (Tb^{3+} = 1, 3, 5, 7, 10, 15 and 20 at.%) nanoparticles at (a) 230, (b) 240 and (c) 322 nm excitation. (d) The change in $^5D_4 \rightarrow {}^7F_6$ transition intensity (492 nm) of as-prepared Tb^{3+} doped $CaMoO_4$ nanoparticles (Tb^{3+} =1, 3, 5, 7, 10, 15 and 20 at.%) at different excitation wavelengths.

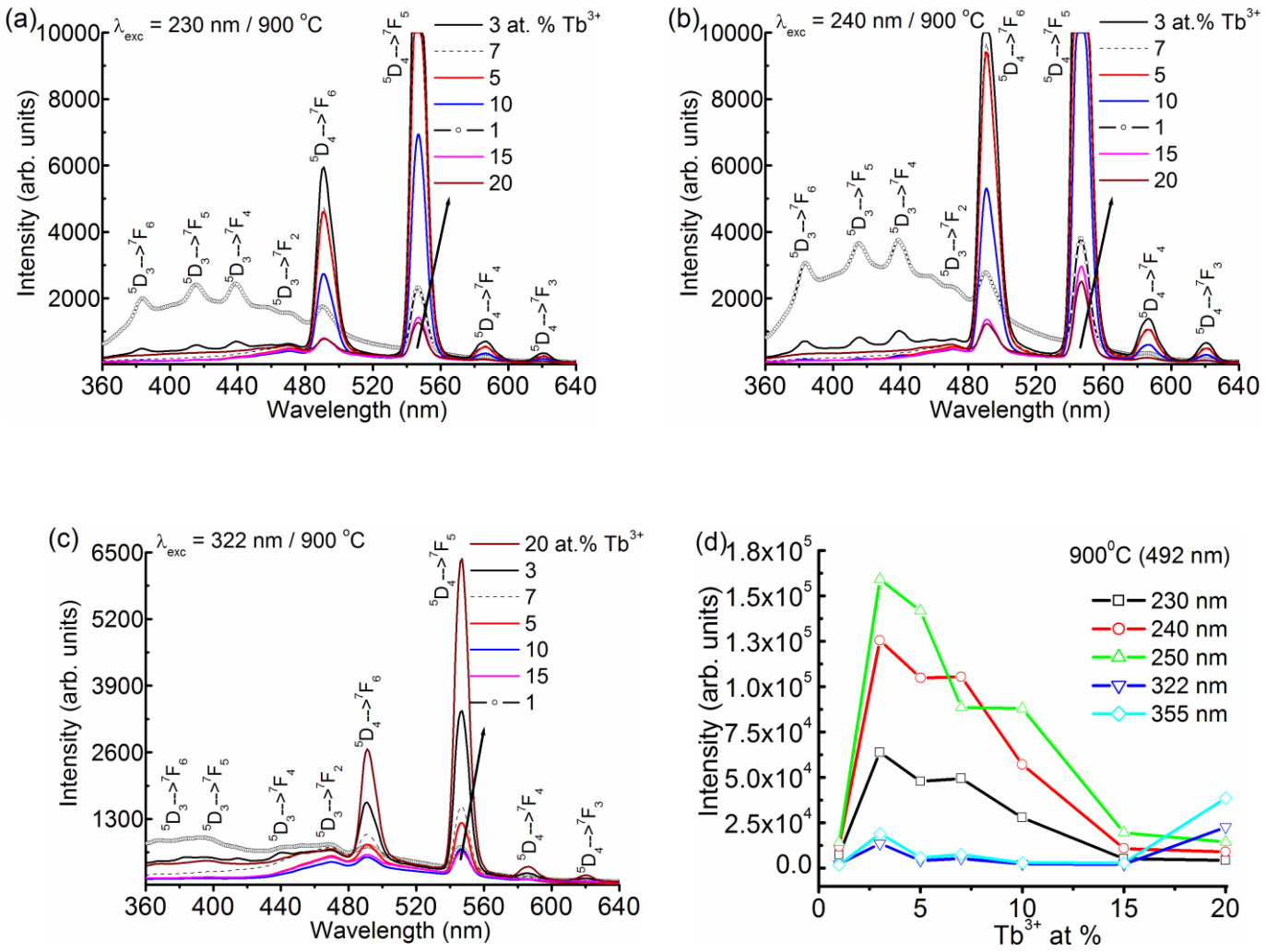

Fig. S6 Luminescence spectra of 900 °C annealed $CaMoO_4:Tb^{3+}$ (Tb^{3+} = 1, 3, 5, 7, 10, 15 and 20 at.%) nanoparticles at (a) 230, (b) 240 and (c) 322 nm excitation. (d) The change in $^5D_4 \rightarrow {}^7F_6$ transition intensity (492 nm) of as-prepared Tb^{3+} doped $CaMoO_4$ nanoparticles (Tb^{3+} =1, 3, 5, 7, 10, 15 and 20 at.%) at different excitation wavelengths.

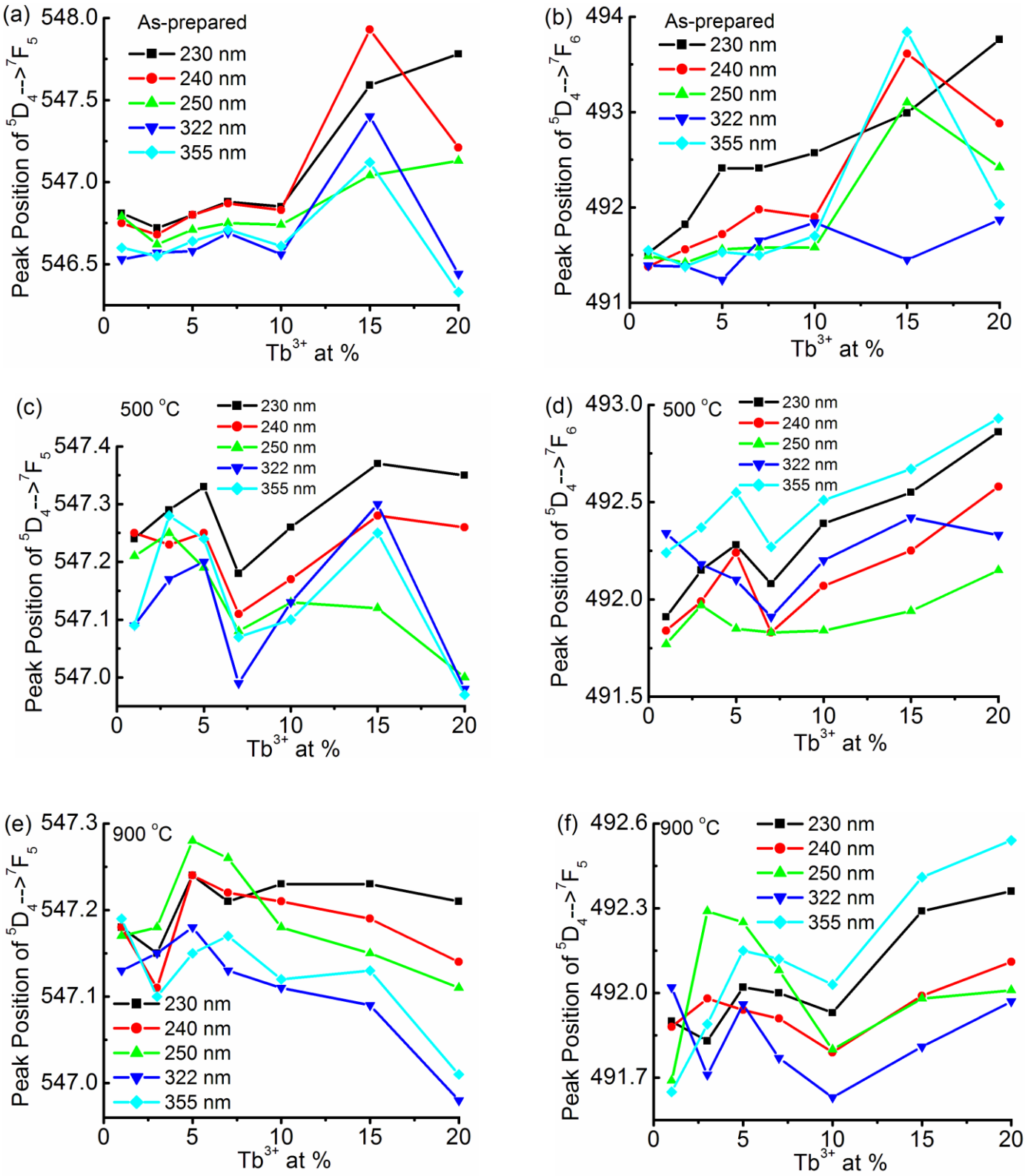

Fig. S7(a-f) Peak positions of $^5D_4 \rightarrow {}^7F_5$ and $^5D_4 \rightarrow {}^7F_6$ transitions in the case of as-prepared, 500 and 900 °C at different excitation wavelengths.

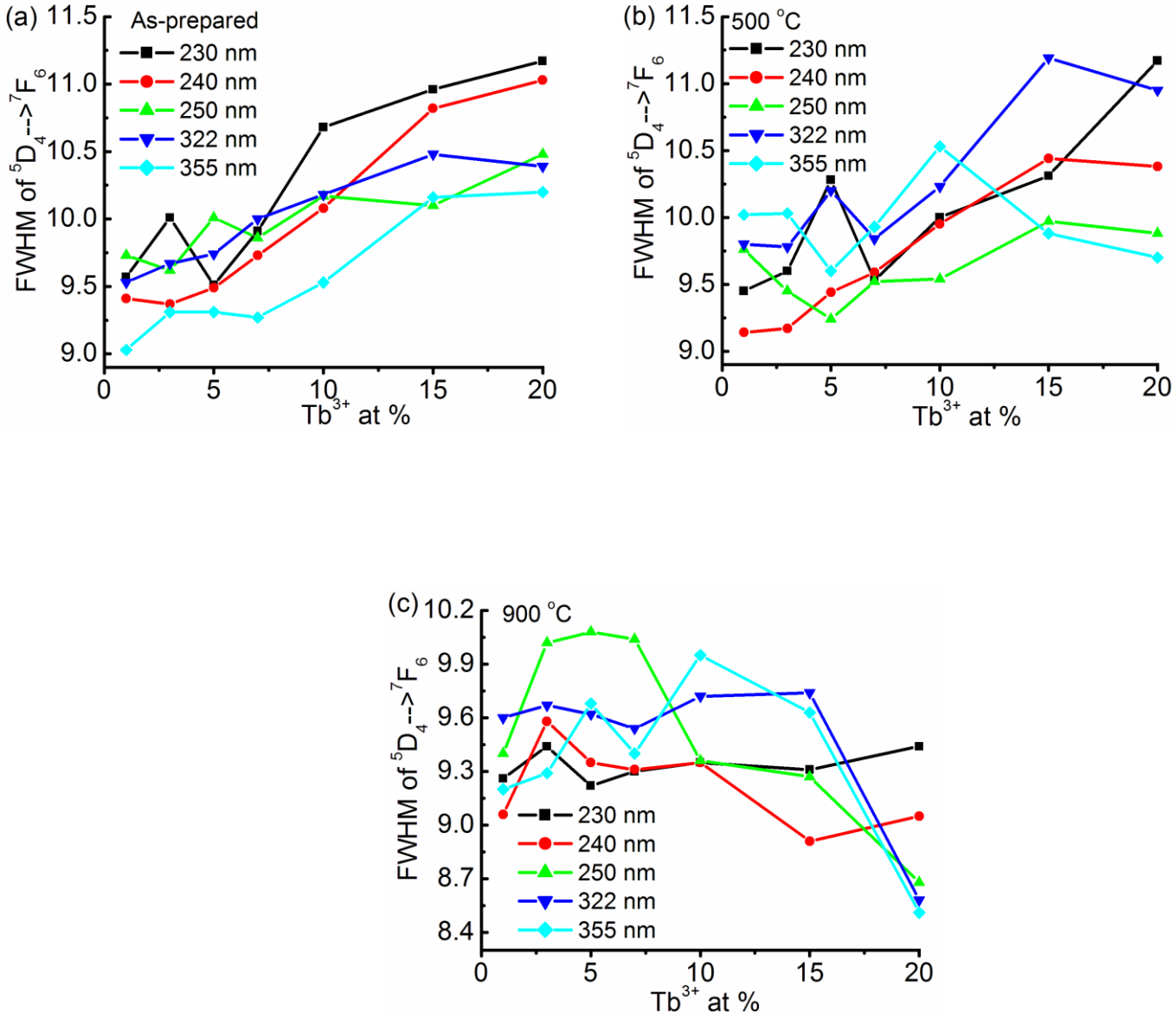

Fig. S8 FWHM values of $^5D_4 \rightarrow {}^7F_6$ transition at 230, 240, 250, 322 and 355 nm of (a) as-prepared, (b) 500 and (c) 900 ^oC at different excitation wavelengths.