■ **Supporting information:**

Rapid, convenient and low-energy preparation of spherical rare earth doped YAG phosphors by laser sintering method

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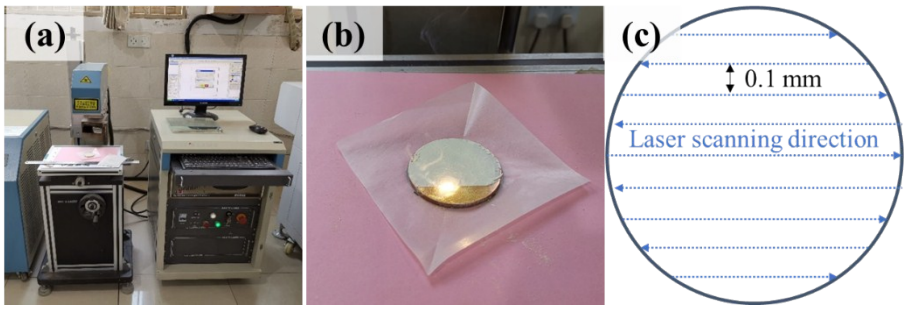

Fig. S1. The configuration diagram of the laser instrument (a), the process of laser sintering method to synthesize phosphor (b), and its scanning path with a scanning interval of 0.1 mm (c).

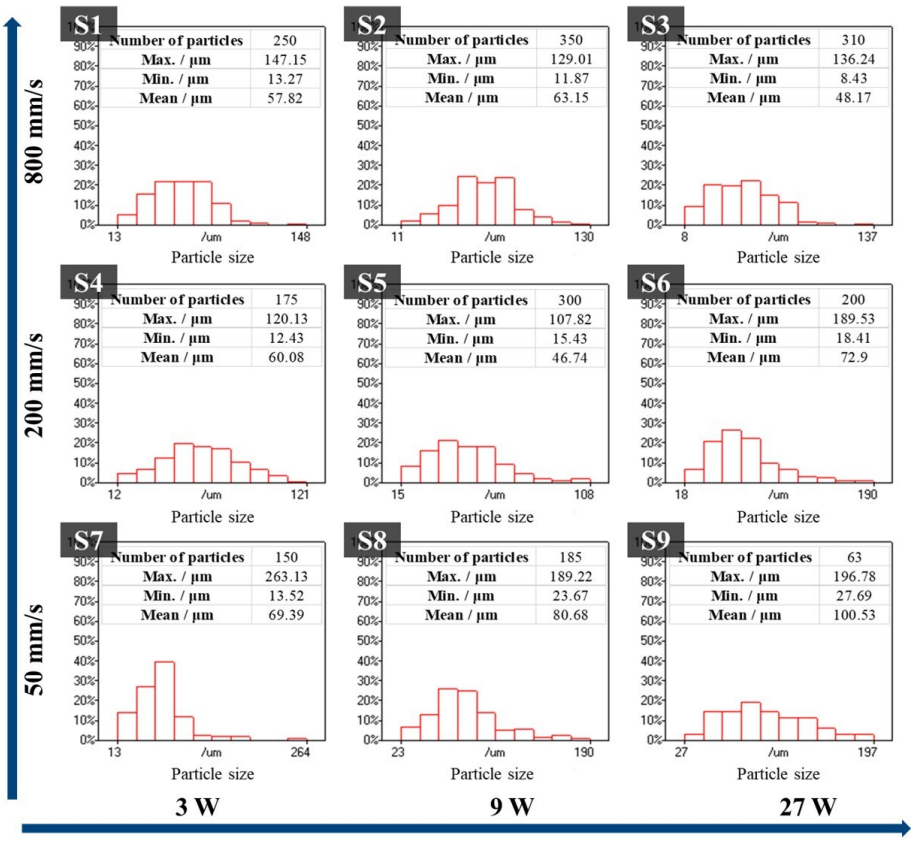

Fig. S2. The particle size distribution of synthesized YAG:Ce phosphors from S1 to S9.

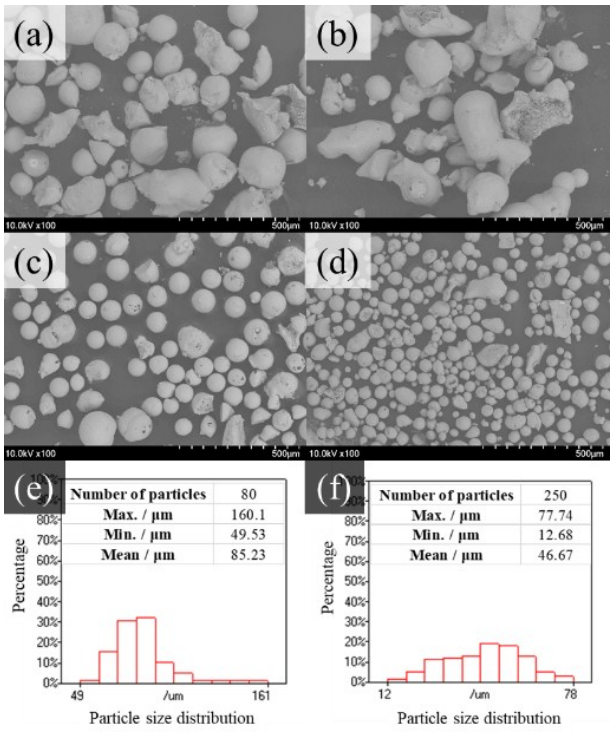

Fig. S3. SEM images of prepared phosphors with powder thicknesses of 800 μm (a), 400 μm (b), 100 μm (c), and 50 μm (d); (e) and (f) are particle size distributions of the phosphors prepared with powder thicknesses of 100 μm and 50 μm, respectively.

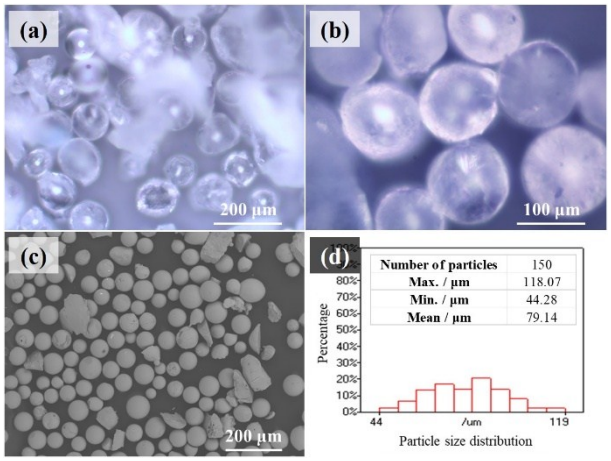

Fig. S4. Photographs (a, b), SEM image (c) and particle size distribution (d) of YAG:Dy phosphors.

Table S1. Analysis about Raman spectra for the phosphor powder and the opaque microsphere.

Raman spectra's peak position (cm^{-1})			**Symmetric type**	**Strengths[36]:** strong (s), weak (w), very weak (vw)	**Vibration modes**
YAG single crystal[36]	Opaque microsphere	powder			
144	140	142	T_{2g}	w	Y or rare-earth ion translation
162	159	160	E_g	s	
218	216	217	T_{2g}	s	
243	—	—	T_{2g}	w	Translation + rotation + ν_3 (AlO_4)
259	258	259	T_{2g}	s	
296	291	294	T_{2g}	w	
310	310	310	E_g	vw	
340	337	338	E_g	s	
370	—	—	T_{2g}	vw	
373	372	371	A_{1g}	w	
403	399	400	E_g	s	
408	—	—	T_{2g}	s	
436	—	—	T_{2g}	vw	
530	—	—	T_{2g}	vw	ν_2 (AlO_4)
531	—	—	E_g	w	
537	—	—	E_g	w	
544	543	545	T_{2g}	w	
561	—	—	A_{1g}	s	
616*[35]	—	—	T_{2g}	—	$\nu_1+\nu_4$ (AlO_4)
690	686	689	T_{2g}	w	
714	715	715	E_g	vw	
719	—	—	T_{2g}	s	
758	—	—	E_g	vw	
783	780	781	A_{1g}	s	
857	855	855	T_{2g}	w	

* This value is calculated frequencies of the Raman active modes according to Reference [35].