

Supporting Information

Thermally Stable High-Contrast Iridescent Structural Colours from Silica Colloidal
Crystal Doped with Monodisperse Spherical Black Carbon Particles as Maverick

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Table S1

Table S1. Preparation condition of colloidal silica nanoparticles^{a)}

Name	Preparation conditions				Particle size	
	25% NH ₃ solution	Ethanol	Water	TEOS	Diameter (nm)	CV (%)
Wp1	15 mL	210 mL	9.5 mL	15 mL	212	3.7
Wp2	15 mL	210 mL	7.0 mL	15 mL	240	4.1
Wp3	15 mL	210 mL	20.0 mL	15 mL	261	3.6
Wp4	15 mL	210 mL	27.0 mL	15 mL	270	3.3

^{a)} Reaction condition: 25 °C, 4 h.

Table S2

Table S2. Preparation condition of π -conjugated polymer nanoparticles

Name	Preparation conditions			Yield		Particle size	
	DHN	TMTA	Solvent (Ethanol / Ethylene glycol)	g	%	Diameter (nm)	CV (%)
Bp1	30 mM	30 mM	100 mL / 100 mL	1.39	80.0	340	6.8
Bp2	30 mM	30 mM	160 mL / 40 mL	1.32	76.2	627	6.4

^{a)} Reaction condition: 75 ° C, 6 h.

Figure S1

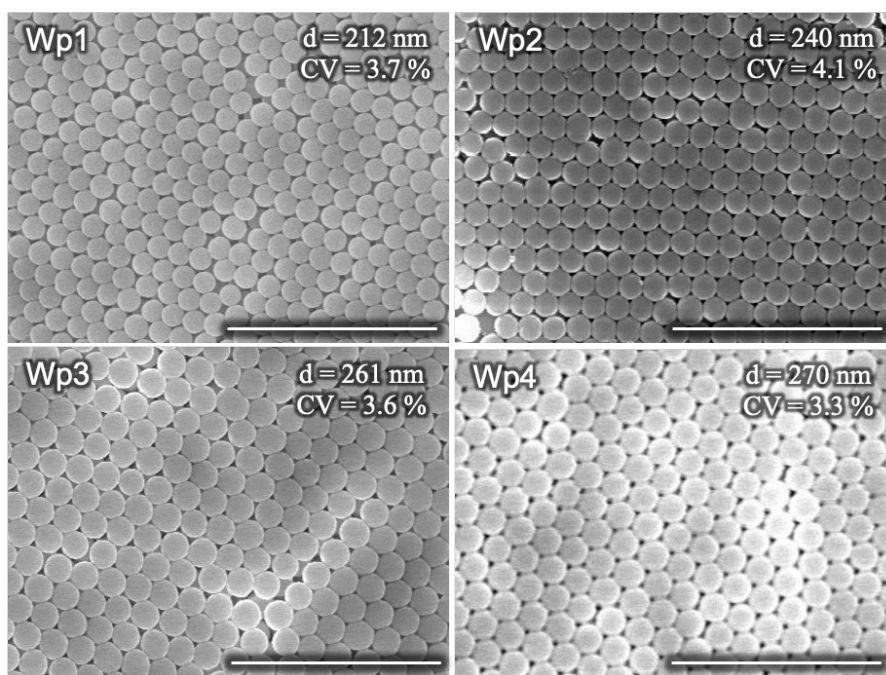


Figure S1. FE-SEM images of silica nanoparticles. Scale bars indicate 2 μm .

Figure S2

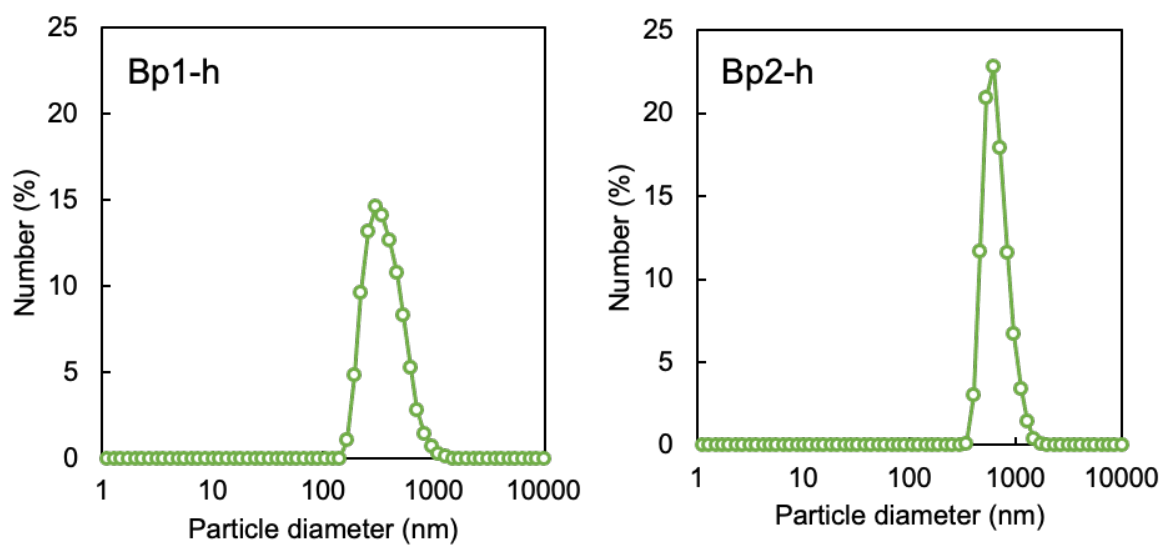


Figure S2. DLS measurements of the aqueous dispersions of Bp1-h and Bp2-h.

Figure S3

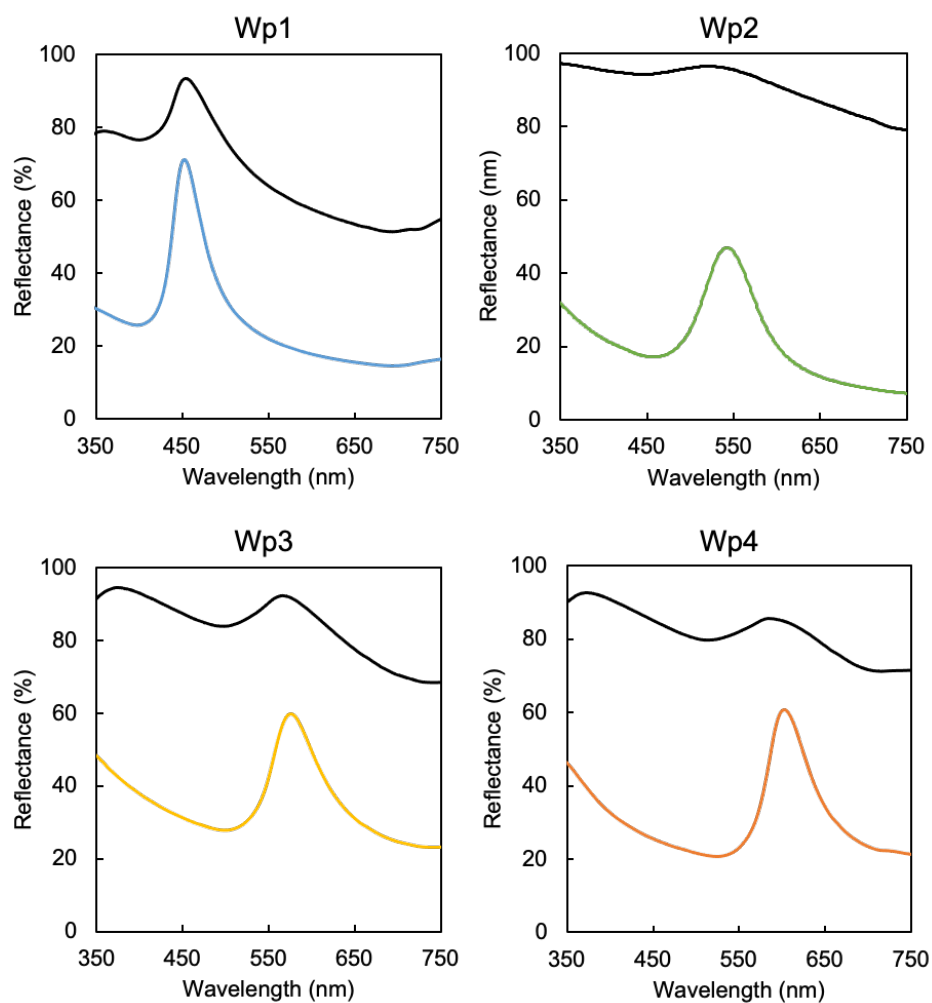


Figure S3. Diffuse reflectance UV-vis spectra of the cast films of the mixture of silica nanoparticles (Wp1, Wp2, Wp3 and Wp4) without (black lines) and with (colored lines) 1 wt% of Bp1-h.

Figure S4

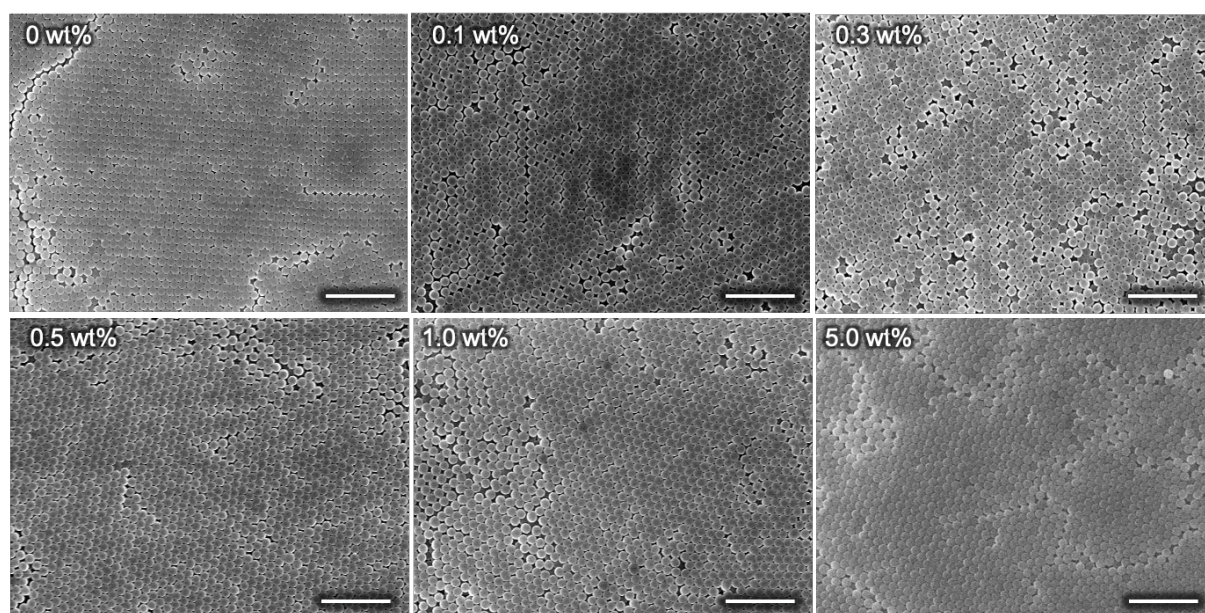


Figure S4. Colloidal crystals from the mixture of Wp2 with various concentrations of Bp1-h. Scale bars indicate 2 μm .

Figure S5

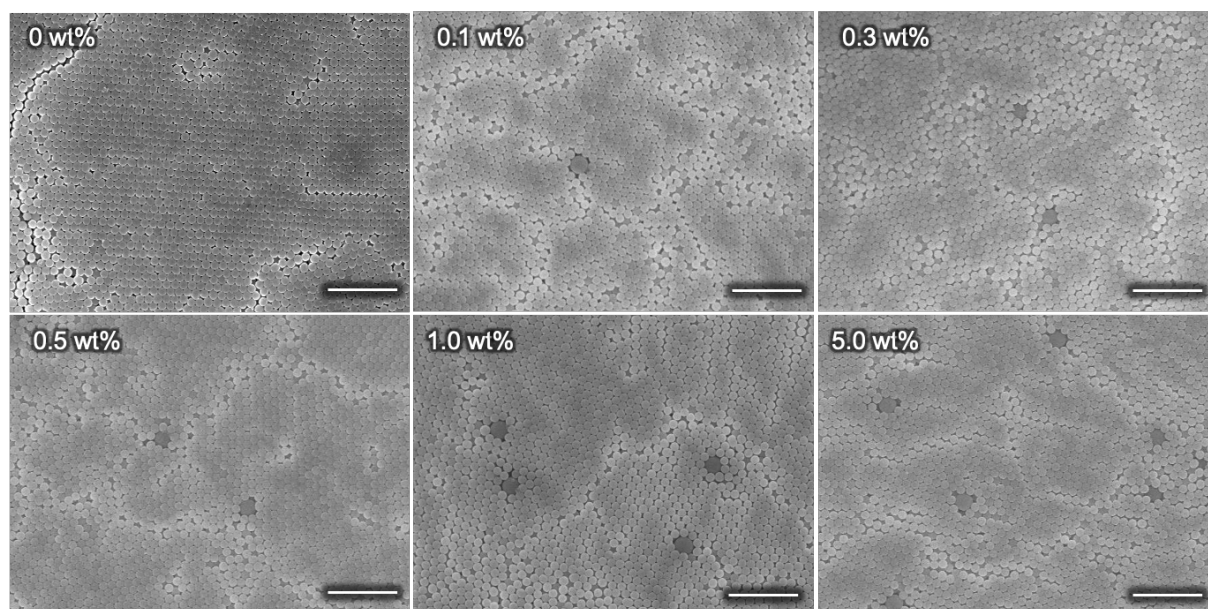


Figure S5. Colloidal crystals from the mixture of Wp2 with various concentrations of Bp2-h. Scale bars indicate 2 μm .

Figure S6

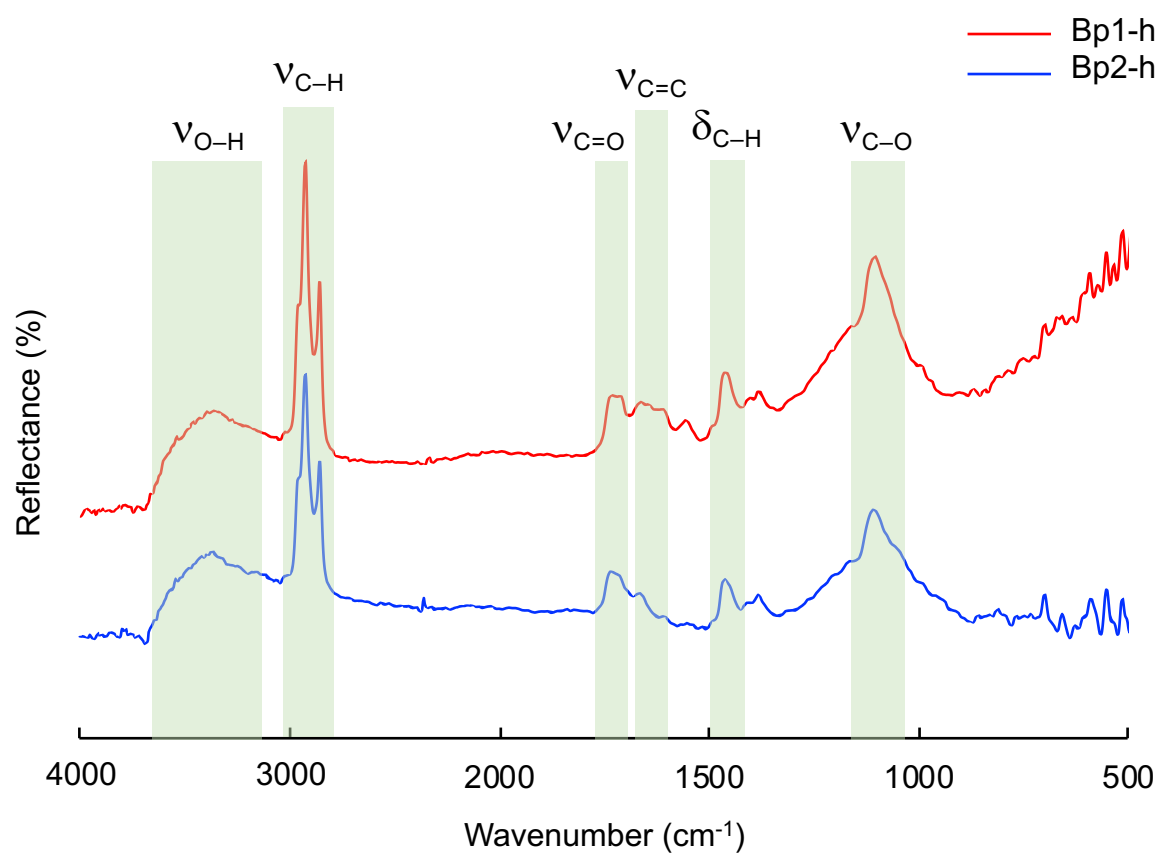


Fig. S6. Diffuse reflectance FT-IR spectra of Bp1-h, and Bp2-h.

Figure S7

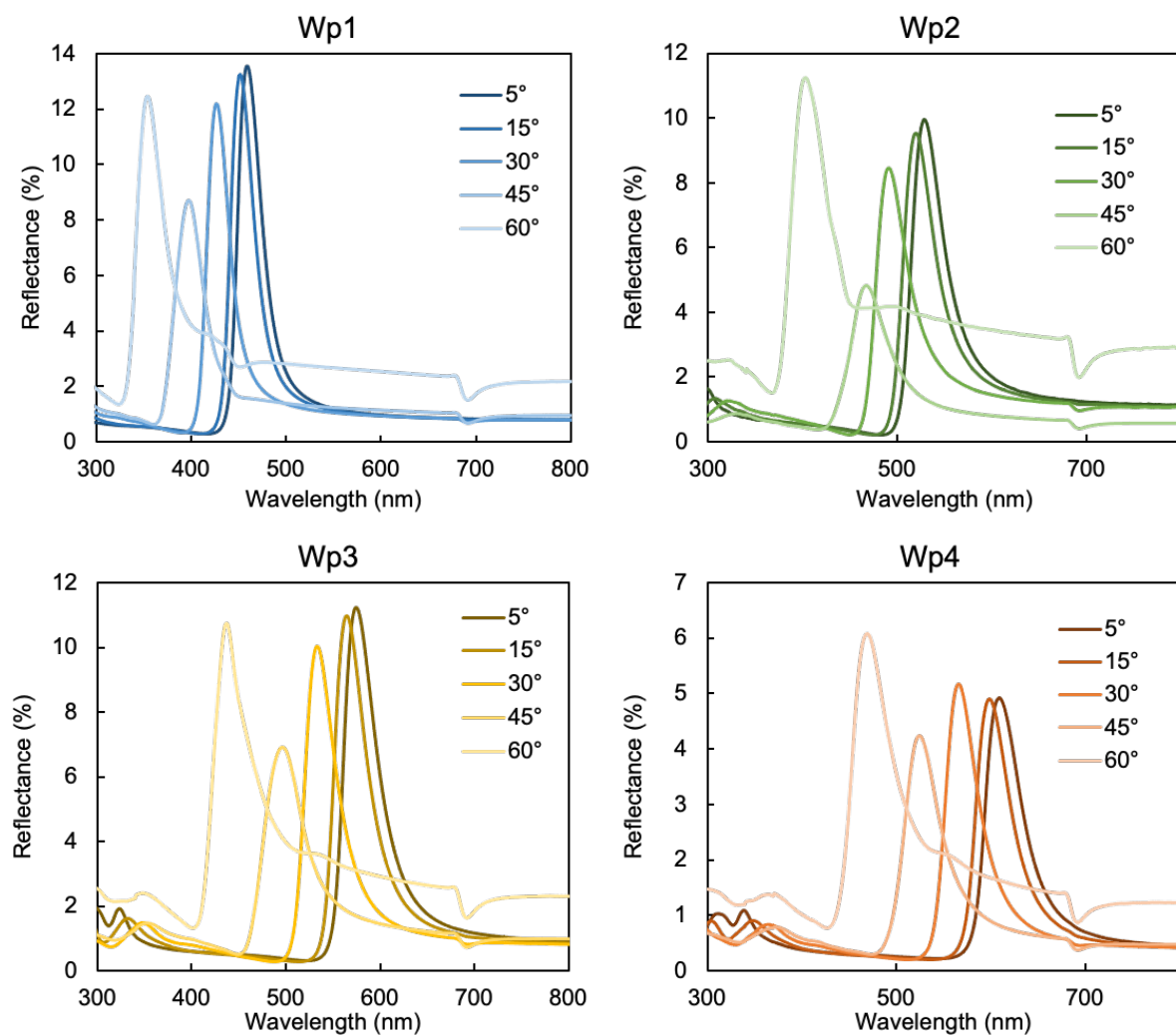


Figure S7. (a) The specular reflectance UV-vis spectra of the cast films of the mixture of colloidal silica nanoparticles (Wp1, Wp2, Wp3 and Wp4) with 1 wt% of Bp1-h.