

Supplementary Material

Effect of plasmonic nanostructures on the optical properties of $\text{CH}_3\text{NH}_3\text{PbI}$ perovskite films

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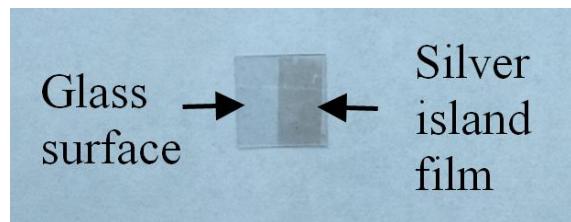


FIGURE S1 |Sample of a cover glass coated with a silver island film.

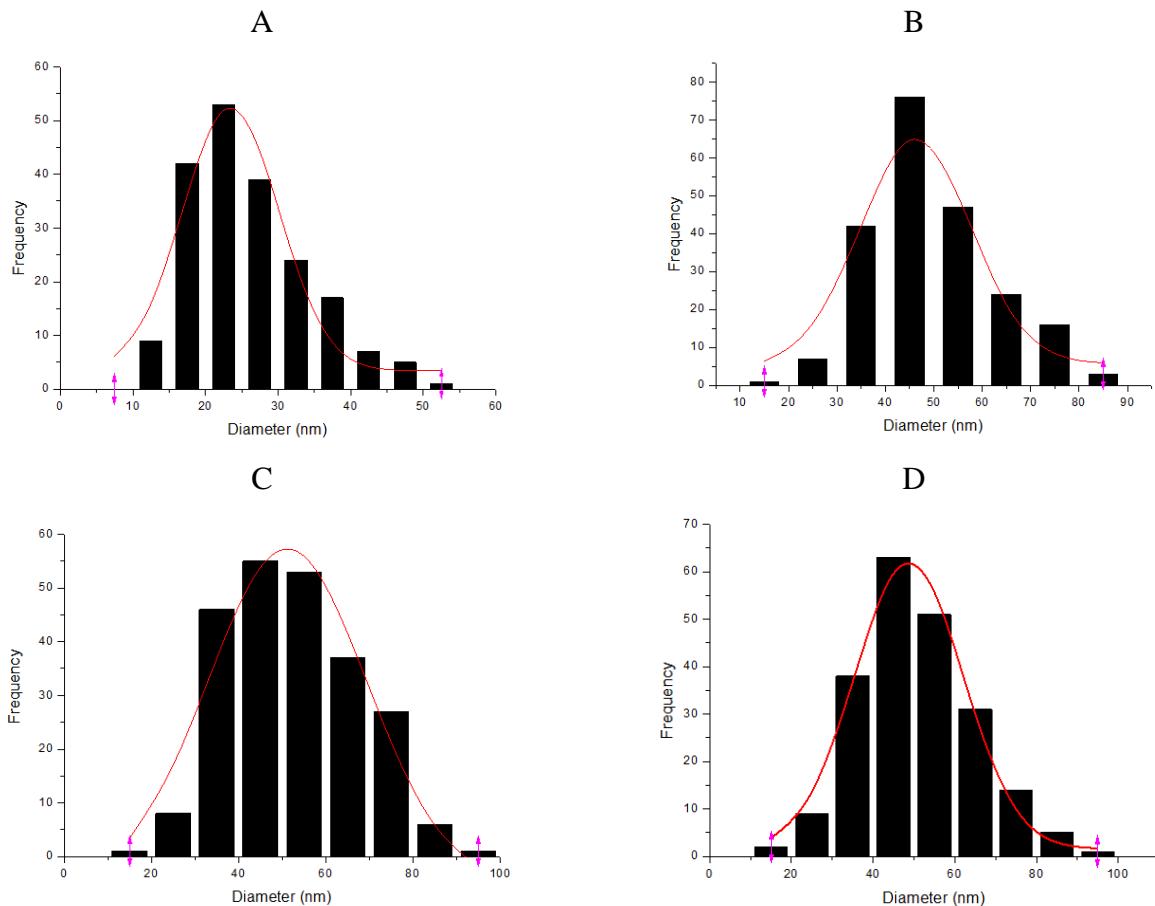


FIGURE S2 | Particle size distribution from SEM-image of silver films before **A)** and after thermal annealing at **B)** 180 °C; **C)** 240 °C; **D)** 260 °C.

TABLE S1| Average size and standard deviation of silver nanoparticles size

Samples	Average size (nm)	Standard deviation (nm)
before annealing	25.9	6.7
180° C	49.8	9.9
240° C	51.1	18.2
260° C	48.8	13.3

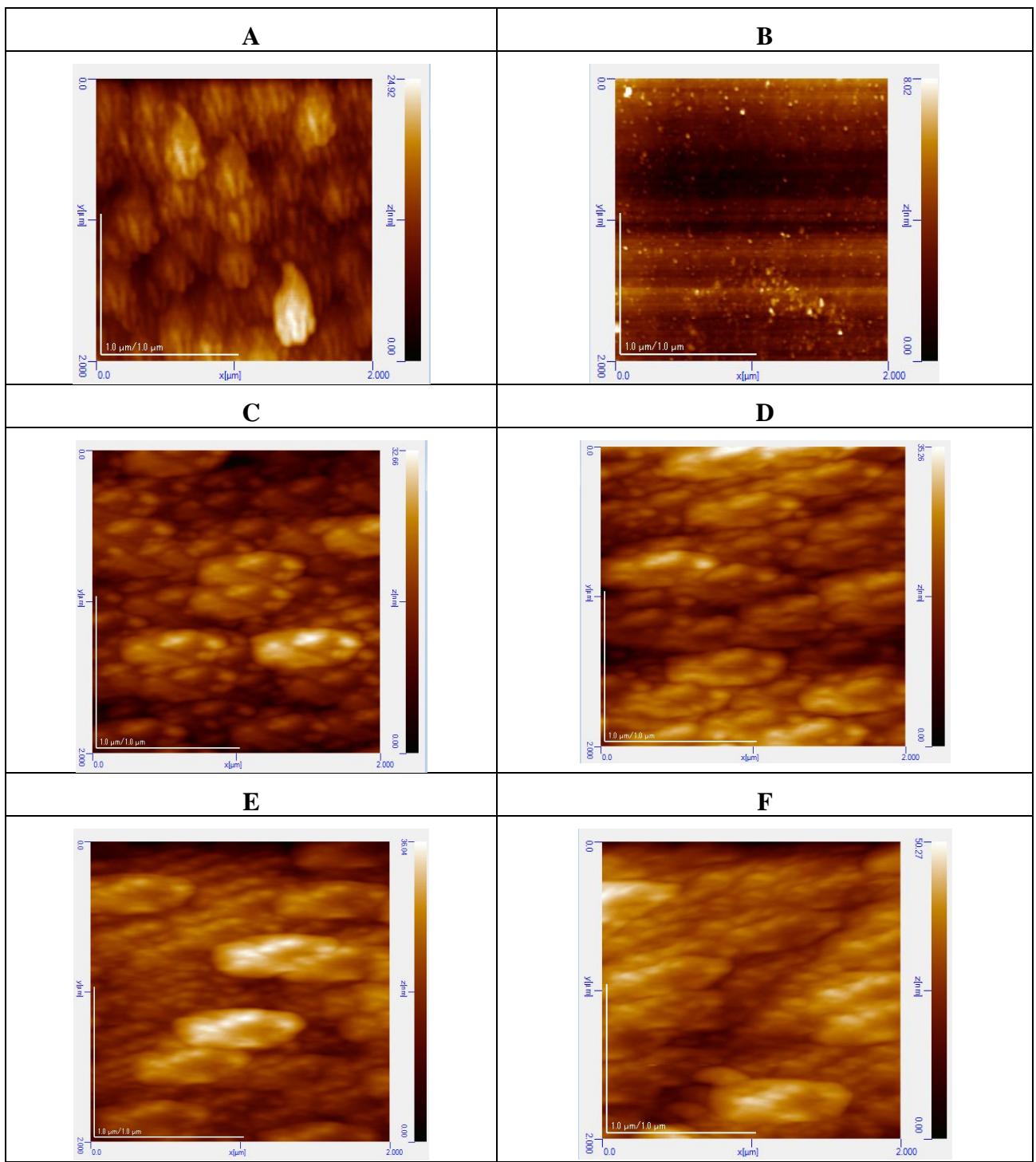


FIGURE S3 | AFM images of silver films with area $2 \times 2 \mu\text{m}$, obtained by tapping mode. Annealing temperature: **A)** without annealing; **B)** 180 °C; **C)** 200 °C; **D)** 220 °C; **E)** 240 °C; **F)** 260 °C.

TABLE S2| Effect of the thermal annealing on the roughness parameters of SIF in the image 2×2 mkm

Annealing temperature of silver island films	Ra, nm	Rq, nm	RzjIS, nm	Rz, nm	S, mkm ²	S, ratio
Glass surface	2,13	3,05	11,63	23,61	4,0	1
Before annealing	2,72	3,49	11,87	24,92	4,0	1
200 ⁰ C	3,98	4,98	15,74	32,66	4,0	1,01
220 ⁰ C	4,27	5,27	17,09	35,26	4,0	1,01
240 ⁰ C	4,15	5,35	18,49	37,85	4,0	1,01
260 ⁰ C	5,54	7,02	24,39	50,27	4,0	1,01

The table showed the roughness parameters determined using the AFM software (WinspmII Data Processing), where Ra is the average roughness; Rzjis - 10-point average roughness; S - image area; Rq - root mean square roughness; Rz is the difference between the maximum and minimum height of the analyzed image; Sratio - ratio of the image area S to the area of a smooth surface S₀.

TABLE S3| Spectral parameters of silver island films.

Annealing temperature of silver island films	Before solvent treatment			After solvent treatment			λ_{Absmin} (nm) (400-500 nm)	$\lambda_{Abs}(\text{nm})$ (560-720 nm) (For difference spectrum, curve 4, Figure 5)
	D	λ_{Absmax} (nm)	$\Delta\lambda_{1/2}$ (nm)	D	λ_{Absmax} (nm)	$\Delta\lambda_{1/2}$ (nm)		
Before annealing	0,296	490	246	0,314	466	228	-	
180	0,384	432	139	0,373	422	276	424	
200	0,336	426	140	0,298	422	136	426	
220	0,313	426	132	0,398	418	140	438	626
240	0,498	432	85	0,564	444	202	446	630
260	0,711	444	85	0,503	446	82	446	640
280	0,264	456	165	0,400	442	203		