

ELECTRONIC SUPPLEMENTARY INFORMATION

Highly Photoluminescent, Dense Solid Films from Organic-capped $\text{CH}_3\text{NH}_3\text{PbBr}_3$

Peroxskite Colloids

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Table S1. Photoluminescence data of $P_{1\text{-ADA-carboxylic}}$ series as colloids. Average lifetime, calculate as $\tau_{av} = \frac{\sum A_i \tau_i^2}{\sum A_i \tau_i}$ where τ_i are the decay times and A_i represents the amplitudes of the components, values obtained from the fitted PL kinetic decay traces.

	Amine	Carboxylic Acid	λ_{max}^a (nm)	Φ_{PL}^b	$\tau_{av}^{c,d}$ (ns)
1	1-ADA	Oleic acid	521	87	30
2	1-ADA	Decanoic acid	523	81	47
3	1-ADA	Octanoic acid	523	85	116
4	1-ADA	Hexanoic acid	525	82	93
5	1-ADA	Isobutanoic acid	526	78	181
6	1-ADA	Propanoic acid	526	66	125
7	1-ADA	1-Adamantanecarboxylic acid	522	72	78

^a PL maximum wavelength; ^c PL quantum yield; ^c average lifetime, the PL decays, registered at the PL peak maximum, were fitted with a triexponential function of time.

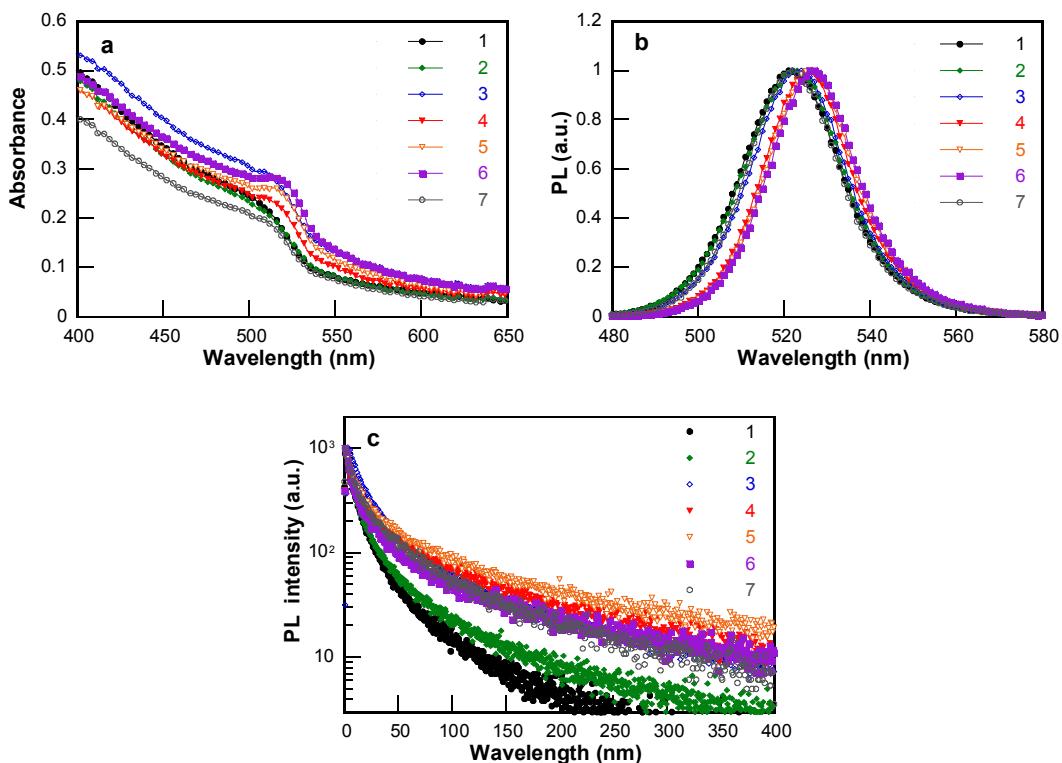


Figure S1. a) Absorption spectra; b) PL emission spectra and c) PL kinetic decay traces of $\text{CH}_3\text{NH}_3\text{PbBr}_3$ nanoparticles capped with 1-ADA and carboxylic acid. See details in table S1.

Table S2. Photoluminescence data of the P₂ADA-carboxylic series as colloids

	Amine	Carboxylic Acid	$\lambda_{\text{max}}^{\text{a}}$ (nm)	FWHM ^b (nm)	$\Phi_{\text{PL}}^{\text{c}}$	$\tau_{\text{av}}^{\text{d,e}}$ (ns)
8	2-ADA	Oleic acid	518	26	94	32
9	2-ADA	Decanoic acid	521	26	94	76
10	2-ADA	Octanoic acid	517	26	98	34
11	2-ADA	Hexanoic acid	519	27	96	40
12	2-ADA	Isobutanoic acid	519	27	95	50
13	2-ADA	Propanoic acid	516	27	98	33
14	2-ADA	Adamantanecarboxylic acid	516 ¹⁻	26	97	41

^a PL peak maximum; ^bfull width at half maximum; ^cPL emission quantum yield; ^daverage lifetime. The PL decays, registered at the PL peak maximum, were fitted with a triexponential function of time.^e

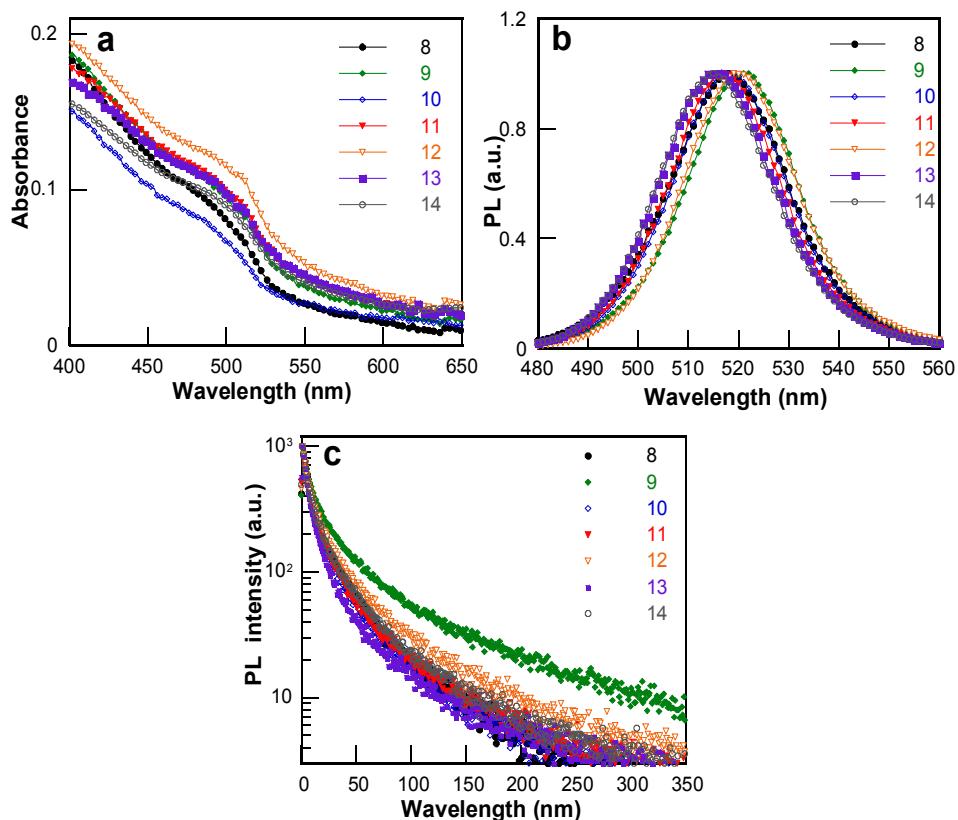


Figure S2. a) Absorption spectra; b) PL emission spectra and c) PL kinetic decay traces of $\text{CH}_3\text{NH}_3\text{PbBr}_3$ nanoparticles capped with 2-ADA and carboxylic acid. See details in table S2.

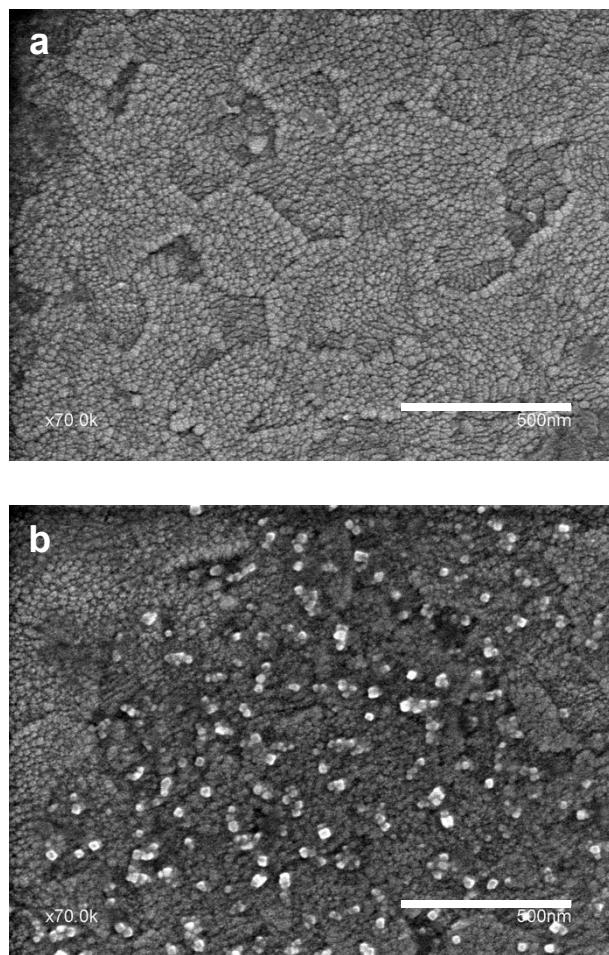


Figure S3. Scanning electron Microscopy (SEM) images of: a) ITO coated Glass and b) $P_{2ADA\text{-}propionic}$ nanoparticles deposited on ITO coated Glass.

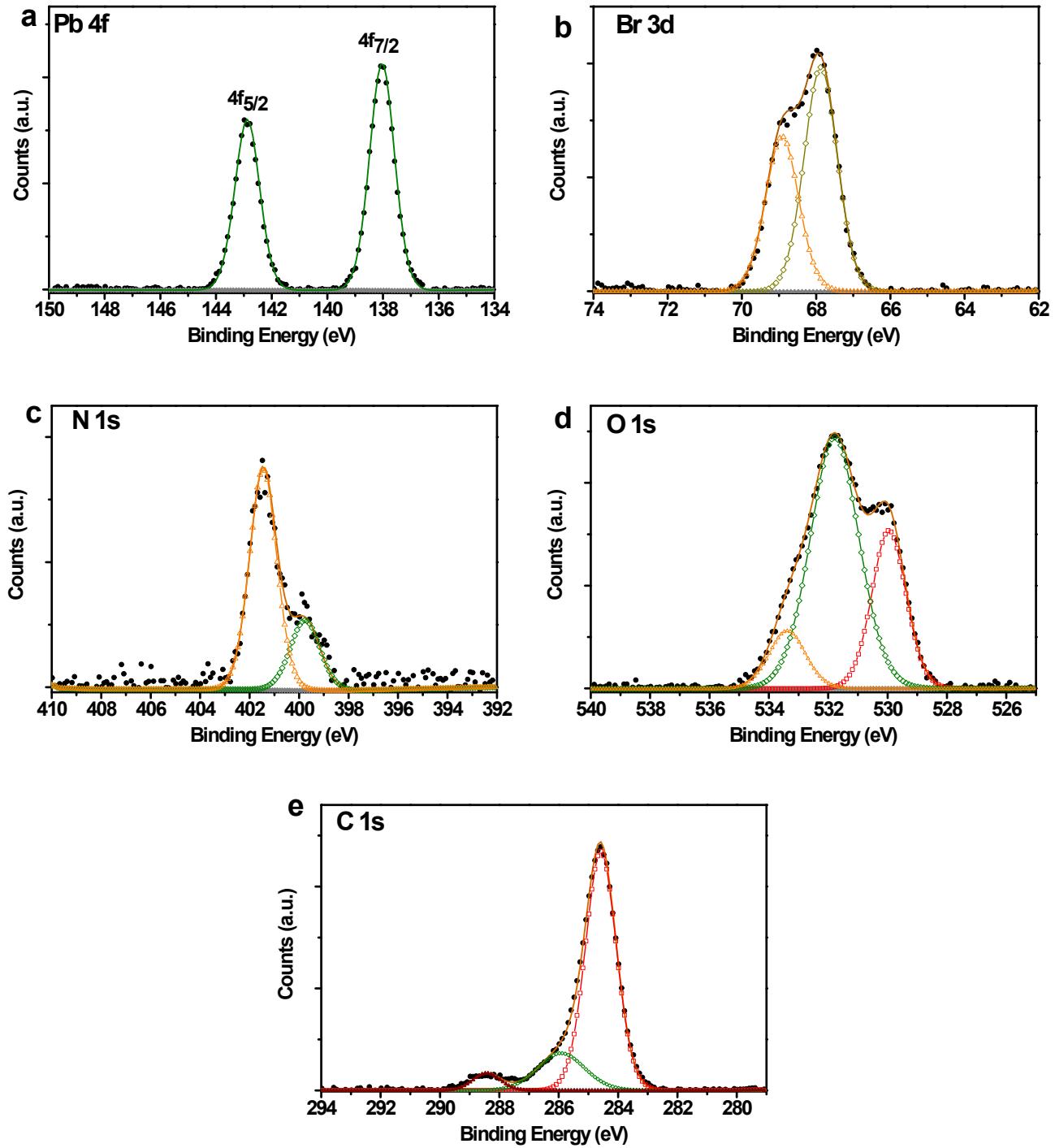


Figure S4. XPS spectra corresponding to: a) Pb 4f; b) Br 3d; c) N 1s; d) O 1s and e) C 1s of P₂ADA-propanoic nanoparticles.

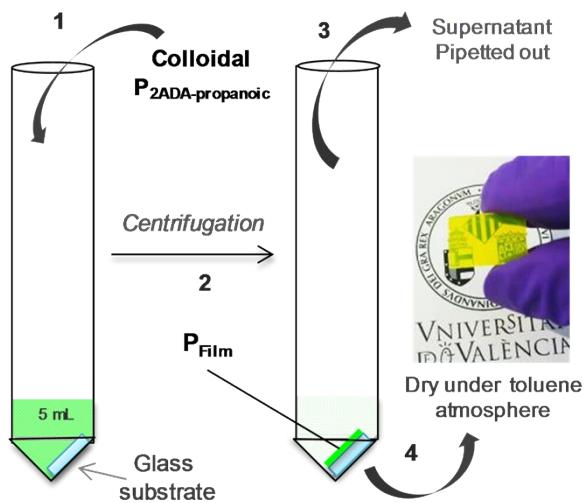


Figure S5. Schematic representation of the centrifugal casting method used for film preparation.

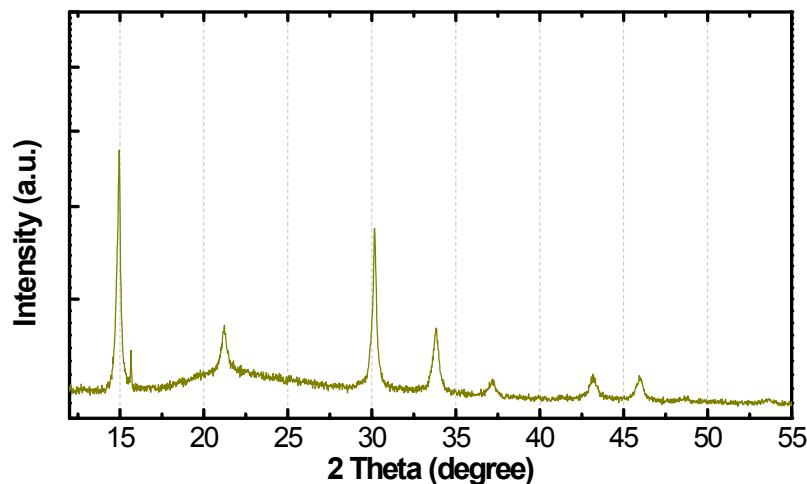


Figure S6. X-ray diffraction of P₂ADA-propanoic NP solid film