Supplementary Materials

2D Organic-Inorganic Halide Perovskites for hybrid heterostructures: single crystals, thin films and exfoliated flakes.

Fabrizio Ciccarelli[1], Mario Barra[1], Antonio Carella[2], Gabriella Maria De Luca[3], Felice Gesuele[3], Fabio Chiarella[1,*]

[1] CNR-SPIN, c/o Dipartimento di Fisica "Ettore Pancini", P.le Tecchio, 80, I-80125 Naples, Italy.

[2] Dipartimento di Scienze Chimiche, Università degli Studi di Napoli 'Federico II', Complesso Universitario Monte Sant'Angelo, Via Cintia 21, I-80126, Napoli, Italy

[3] Physics Department, University of Naples 'Federico II', Naples, Italy.

*Corresponding Authors

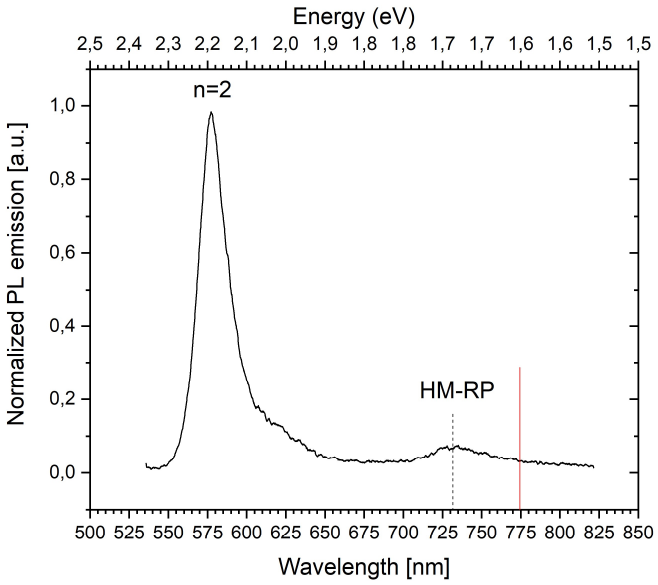

Figure S1: Photoluminescence (PL) emission spectra of Ruddlesden–Popper perovskite crystals with n = 2 with the presence of an emission peak at 730 nm maybe related to a High Member Ruddlesden–Popper (HM-RP). The red line is reference for the emission wavelength of MAPI.

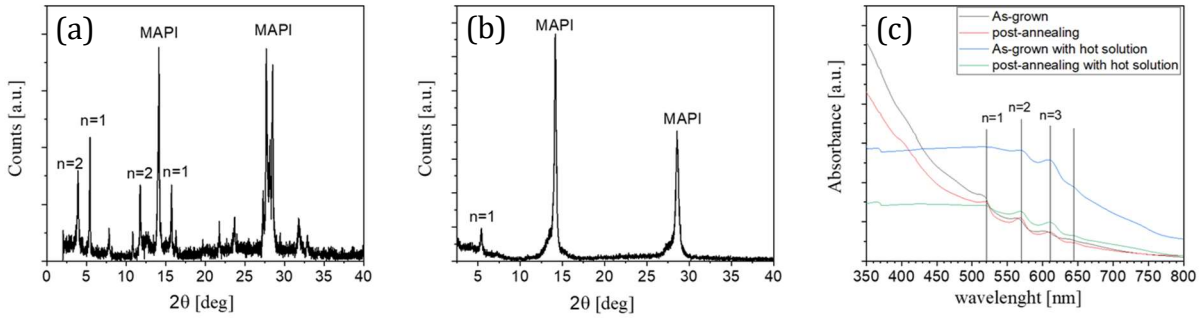

Figure S2: XRD (a,b) and absorption spectra (c) of films deposited by spin coating on glass substrates using a solution in DMF (0.2 mol/L) obtained dissolving the salts PbI_2 : CH_3NH_3I : $C_8H_9NH_3I$ in a stoichiometric ratio of 3:2:2 to obtain n =3 e.g. $(C_6H_5C_2H_4)_2(CH_3NH_3)_2Pb_3I_{10}$). In (a) we used to heating the solution at 100° and applying post-annealing procedure. In (b) we used only post-annealing procedure. For all the films, we use the following spin coating parameters: spin speet 3000 rpm, spin time 60 s, acceleration 1500 rad/s^2.

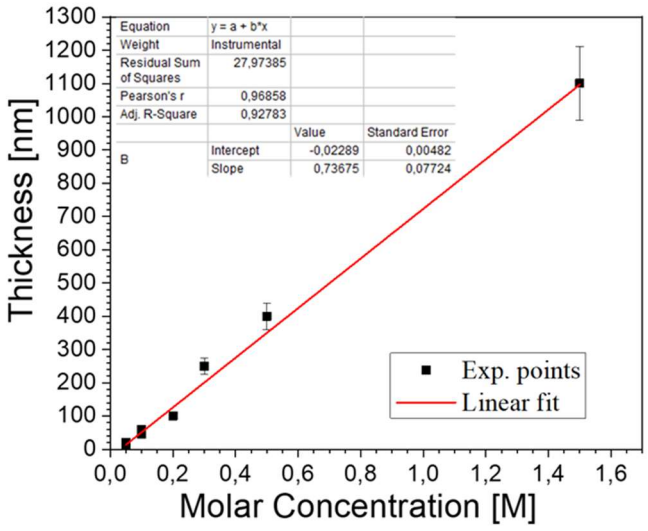

Figure S3: Graph of the film thickness of PEPI-1 measured by AFM at different molar concentration. A linear behavior is observed; the red line is a linear fit of the data, fit parameters table is reported in the inset.