Supporting information

Emergence of lead halide perovskite colloidal dispersions through aggregation and fragmentation: Insights from the nanoscale to the mesoscale

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UV-vis measurements

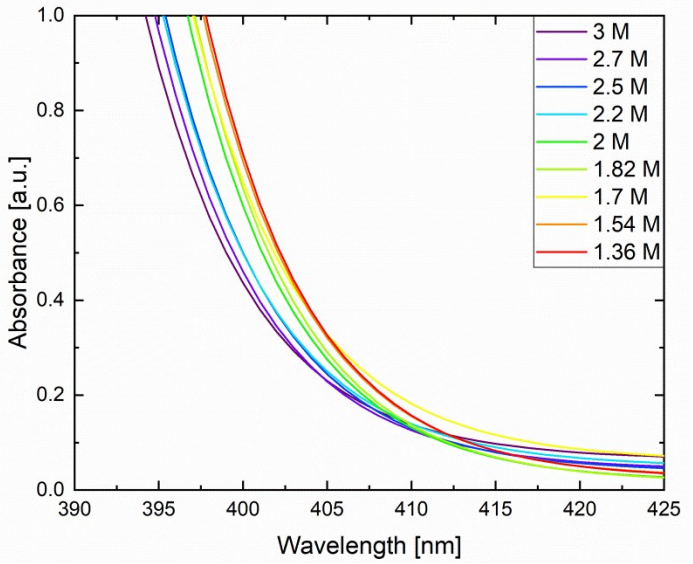

Fig. S1 UV Vis data for $MAPbBr_3$ in regime III (high concentration) showing a red shift of the absorption tail with increasing dilution

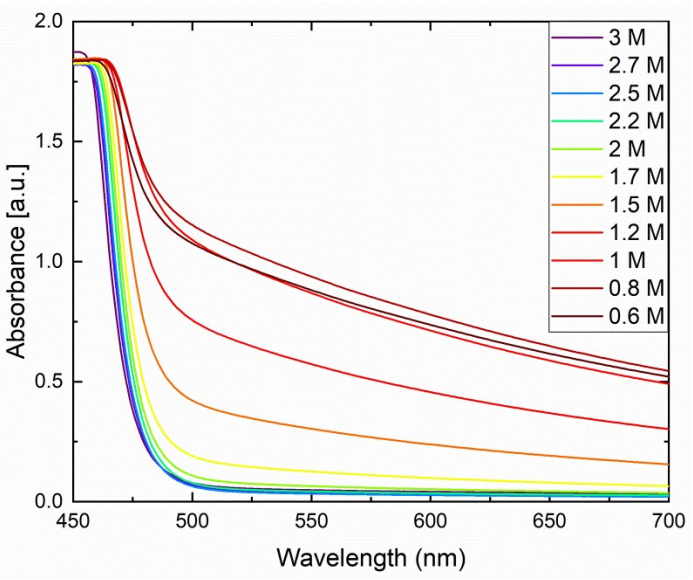

Fig. S2 UV Vis data for $MAPbI_{1.50}Br_{1.50}$ in high concentration regime showing a red shift of the absorption tail with increasing dilution, the emergent spectroscopic signature from large plumo-halide complexes.

DLS measurements

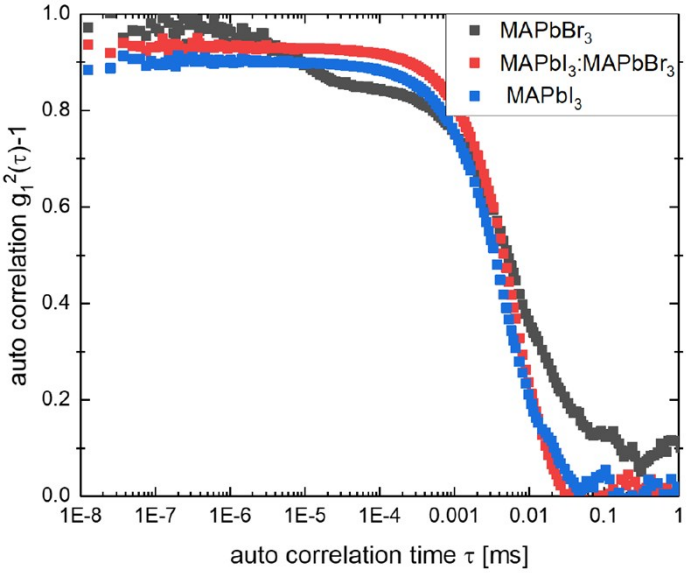

Fig. S3 Auto-correlation functions exhibiting the decay times for the different precursors at 1M. $MAPbBr_3$ exhibits two distinct decays signifying the presence of two structures.

Parameters	$MAPbBr_3$	$MAPbI_{1.50}Br_{1.50}$	$MAPbI_3$
DLS scattering intensity	170 kHz	440 kHz	430 kHz

Tab. S1 Scattering intensities from DLS from precursors at 1M.

Refractometry measurements

A Krüss Optronic Abbe refractometer from A.KRÜSS Optronic GmbH (Hamburg, Germany) was used to determine the refractive index of the individual solvents and the solvent mixture 4:1::DMF:DMSO, for obtaining the hydrodynamic radii from the DLS data.

Solvent media	**Refractive index**
DMF	1.4285 @ 20°C
DMSO	1.4767 @ 20°C
4:1::DMF:DMSO	1.4385 @ 20°C

Tab. S2 Refractive indices of solvent systems

Viscosity measurements

An 'Automated Micro Viscometer' from Anton Paar GmbH (Graz, Austria) was used to determine the dynamic viscosity at 20°C and an angle of 70°. The viscosity was determined to be 1.02794 mPa @ 20°C. Underneath is also a measurement representing the evolution of viscosity of the precursor fluid ($MAPbBr_3$) with increasing concentration.

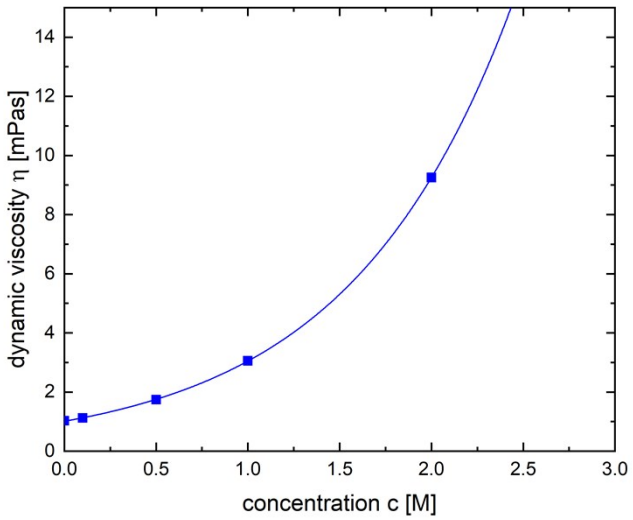

Fig. S4 Evolution of viscosity of the $MAPbBr_3$ precursor fluid with increasing concentration.