

# Intercalation engineering in layered Halide Perovskites

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3D halide perovskites are exciting materials for optoelectronic applications<sup>1</sup> and amazing new solar cell devices<sup>2,3</sup>. 2D Halide Perovskites also allow both stabilizing and functionalizing the 3D structures. More, the number of available layered perovskite compounds is increasing rapidly. A simple spatial interruption in the 3D structure such as intercalation by a layer of molecules, or ions or even a mixture of molecules and ions can dramatically affect the intrinsic properties of the pristine perovskites<sup>4</sup>. Here, a comparison of selected cases is proposed relying both on theoretical studies (quantum confinement effect, mixing of electronic states ...) and experimental measurements (crystallography, spectroscopy, enthalpies of formation). The dielectric profiles along the stacking axis for different cases are also compared<sup>5,6</sup>. Finally, the limit to the thermodynamic stability<sup>7</sup> is explored as a function of the number of layers in a single phase layered perovskites.

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