

Exciton Dynamics in Metal Halide Perovskite Nano-Platelets

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Synthesis routes and optical investigations of highly fluorescent metal halide perovskite nano-platelets with controllable thickness down to one monolayer are reported [1-3]. Quantum size effects lead to drastic blue-shifts of the photoluminescence (PL) and of the excitonic onset for absorption. Exciton binding energies up to 300 meV are found which depend on the number of monolayers present in the respective nano-platelets. The radiative emission rates of these two-dimensional colloidal semiconductors are found to depend on thickness and temperature in a similar way as known for III-V quantum wells. Transient pump-probe and four-wave mixing experiments provide additional insight into the excitonic properties of this novel 2D semiconductor system.

1. J. Sichert et al., *Nano Letters* 15, 6521 (2015)
2. Y. Tong et al., *Angew. Chem. Int. Ed.* 55, 13887 (2016)
3. V. Hintermayr et al., *Adv. Materials* 28, 9478 (2016)