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Exciton-polariton emission and absorption in inorganic-organic hybrid crystals ZnTe(en)$_{0.5}$[1] YONG ZHANG, G. M. DALPIAN, B. FLUEGEL, SU-HUAI WEI, A. MASCARENHAS, National Renewable Energy Laboratory, XIAOYING HUANG, JING LI, Rutgers University, LINWANG WANG, Lawrence Berkeley National Laboratory — The ultimate accuracy and quality test of nanotechnologies based on either MBE or MOCVD growth is perhaps to make an ultrashort-period superlattice with one monolayer thick alternating components. However, neither artificially nor spontaneously ordered monolayer superlattices (e.g., GaAs/AlAs or GaP/InP) that have been grown by either MBE or MOCVD have been shown to have the desired perfection [1,2]. Recently, we have successfully synthesized a group of II-VI based inorganic-organic crystalline hybrid superlattices with single atomic-layer thick inorganic slabs and single molecular-length organic spacers [3]. We will report experimental and/or theoretical studies on the exciton-polariton emission and absorption, exciton binding energies, and dielectric properties for a prototype hybrid superlattice ZnTe(en)$_{0.5}$ [4,5]. [1] J. Li et al., PRL 91, 106103 (2003). [2] Spontaneous Ordering in Semiconductor Alloys, edited by A. Mascarenhas. [3] X. Huang et al., JACS 122, 8789 (2000); 125, 7049 (2003). [4] B. Fluegel et al., PRB 70, 205308 (2004). [5] Y. Zhang et al., PRL (in press).

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