

### Cd-to-Zn cation exchange of CdSe-based colloidal nanoplatelets

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Colloidal nanoplatelets (NPLs) have drawn considerable attention due to their unique optical properties such as narrow emission bandwidth, fast radiative recombination and polarized emission. But most research has been focused on toxic Cd-based material (CdSe, CdS, CdTe) due to synthetic limitation. Synthesis of Cd-free NPLs is highly desired for various application, and cation exchange could be a powerful strategy. In this study, we demonstrate the direct cation exchange from CdSe to ZnSe by using chemical complex of zinc halide and organic ligand. The strategy was applied in CdSe/ZnS core/shell NPLs, and successful cation exchange was confirmed by compositional, structural and optical analysis. Direct cation exchange without going through Cu produces emissive Zn-based NPLs, and resulting  $Cd_{1-x}Zn_xSe/ZnS$  core/shell NPLs maintained unique optical properties of NPLs such as polarized emission. We produced new heterostructured NPLs based on ZnSe by cation exchange and suggest its potential as a blue emitter.