

### 그래핀 산화물과 나노입자 복합구조체

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In this study, we used graphene oxide (GO) as a template for uniform 2-D dispersion of nanocrystals. Interestingly, when we mix CdSe nanocrystals with GO in aqueous solution for 12 h, the nanocrystals undergo considerable size increase (from 3.5 nm to 500 nm) and crystalline transformation (from wurtzite CdSe to amorphous Se). The formation of amorphous Se globules indicates that GO promotes the cleavage of Cd-Se bonding and turns the structure in to Se. By tuning acidity of the bulk solution, we can minimize the undesirable transformation. Other nanocrystals, e.g., PbSe, CoPt<sub>3</sub>, and Co, were also blended with GO and we monitored their compositional and structural deformation. The set of experiments confirm that local acidity near the graphene oxide surface plays a critical role in the cleavage of the bonding and photogenerated charge carriers trapped in the functional groups of GO surface affect the crystalline deformation and transformation. We identified reaction conditions, pH or concentration, that allow nanocrystals to deposit on GO surface in uniform 2-D dispersion.