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Hybrid colloidal assemblies from nanocrystals

Hybrid metal–semiconductor nanostructures offer promising properties by combining fast electron transfer with efficient charge separation. While metal growth on nanorods is well-studied, selective growth on quasi-2D CdSe nanoplatelets (NPLs) remains underexplored. CdSe NPLs, only a few monolayers thick, exhibit exceptional optical features such as high quantum yields and narrow emission bands. [1] The stacking behavior of rigid 5ML NPLs, with their non-bending features, facilitates efficient exciton transfer between neighboring platelets.[2] Polymer encapsulation further stabilizes these structures and provides a versatile platform for surface functionalization.[3] In this poster, we demonstrate regioselective growth of noble metals, such as Palladium (Pd), on 5ML CdSe NPLs using a simple synthetic strategy. We show that the precursor-to-NPL ratio significantly influences the growth mode and site selectivity at the edges and corners of the NPLs. Additionally, we explore polymer encapsulation of non-hybrid NPLs to enhance their stability and enable further surface modifications for possible future applications.

References

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