

Abstract Submitted  
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**A robust method for the synthesis of colloidal PbS nanosheets**  
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LABORATORY COLLABORATION — Two dimensional colloidal PbS semicon-  
ductor materials are interested in low cost and easy processable thin plate optoelec-  
tronic and photovoltaics devices such as solar cells and transistors. Here we report  
a robust method by which colloidal PbS nanosheets can be synthesized with nearly  
100% success rate. It is achieved by replacing lead acetate with lead oxide to pre-  
pare the lead precursor for the reaction. Acetic acid either injected externally or  
produced during the reaction has a significant effect on the growth of the nanosheets  
by turning them into three-dimensional clusters. In the new synthesis, the purity of  
trioctylphosphine (the co-solvent for sulfur precursor) has no significant effect on the  
formation of nanosheets. Thickness tunability is also achieved in the acetic-acid-free  
synthesis.

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