

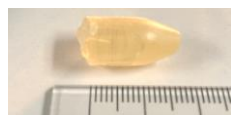
# Hampton PREM Research Highlight

## Optoelectronic Materials: Halide Perovskites Bulk Crystal Growth, Mechano-Chemical Synthesis & Spectroscopy of metal doped halide perovskites

### Bulk Crystal Growth

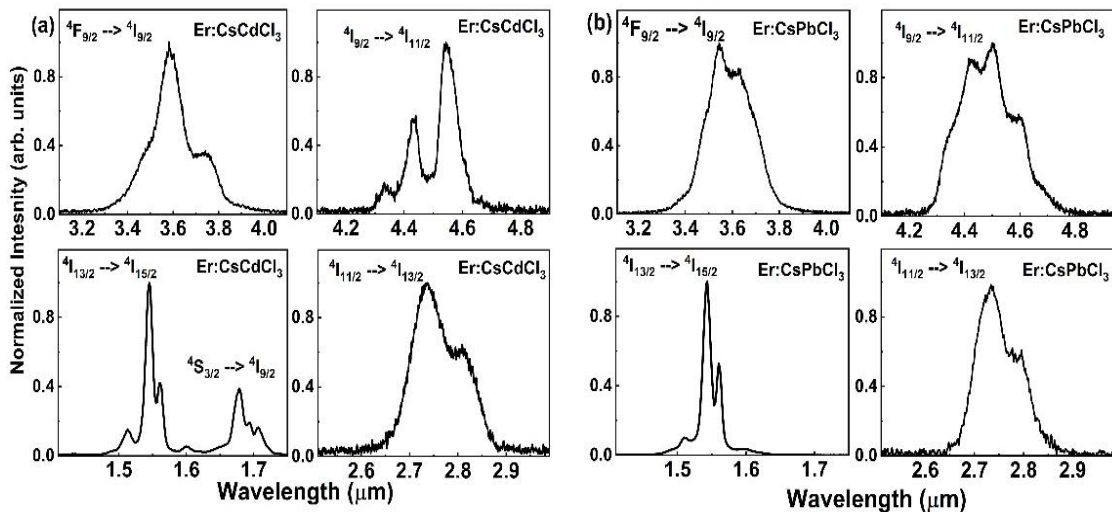


Er: CsCdCl<sub>3</sub>



Er: CsPbCl<sub>3</sub>

Efficient near & mid-IR emission bands from  
Er: CsPbCl<sub>3</sub> and Er: CsCdCl<sub>3</sub>

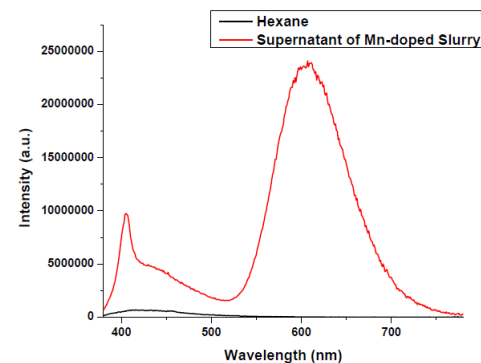
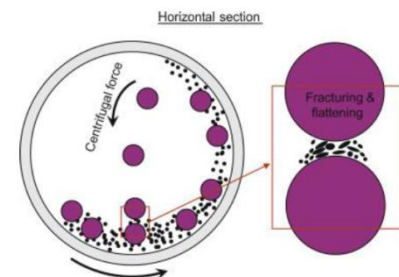


### Mechano-chemical synthesis

Pre-Ball-mill



Ball-mill loading



### Main achievements:

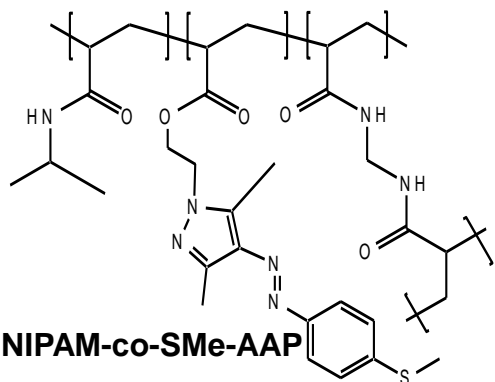
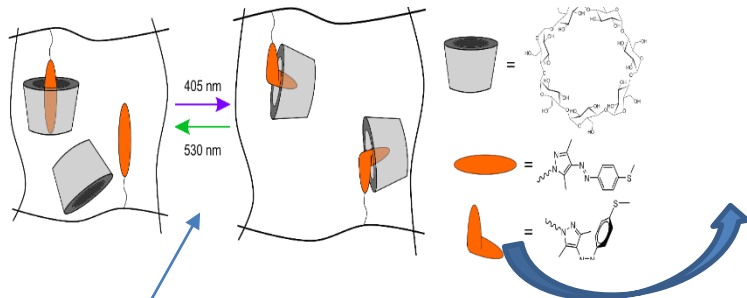
- > Crystal Growth of Er: CsPbCl<sub>3</sub> & Er: CsCdCl<sub>3</sub> perovskites for near and mid-IR-photonics.
- > Mechano-Chemical Synthesis of Mn: CsPbCl<sub>3</sub> nano/micro particles as red-emitting phosphor

This work was supported by PREM NSF# DMR1827820

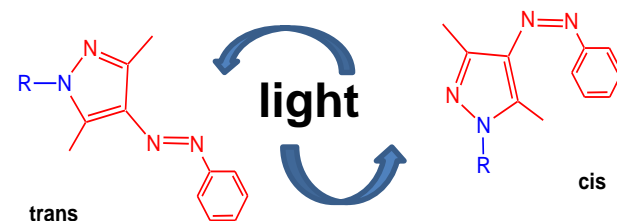
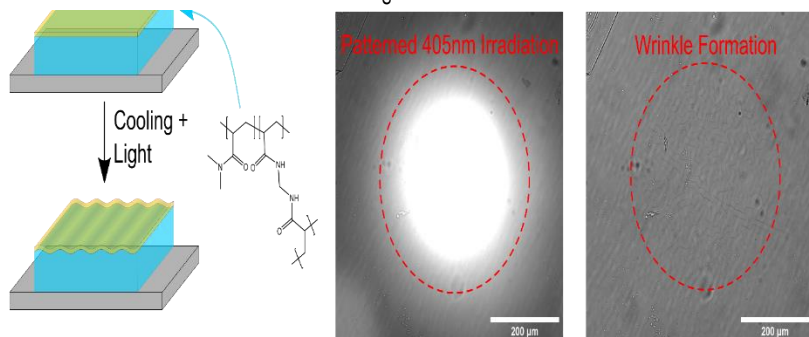
# Hampton PREM Research Highlight

## Fabrication of Visible-Light Responsive Arylazopyrazole (AAP) Based Functional Materials

### Reversible host-guest hydrogels complexation and patterned polymeric network films

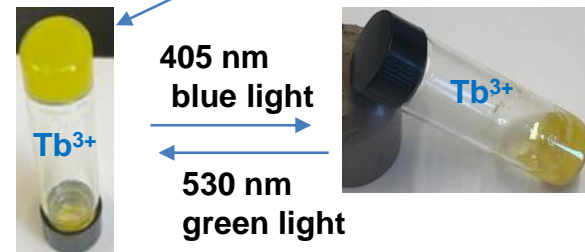
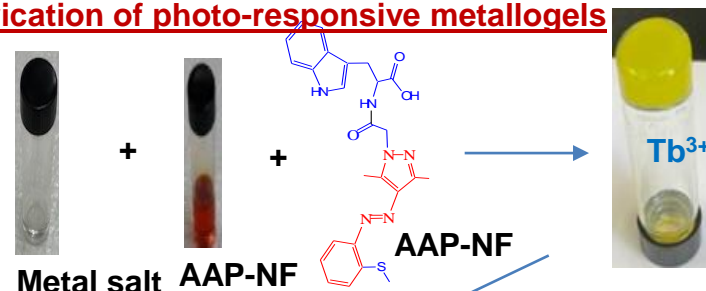


PNIPAM polymeric hydrogel network undergoes swelling upon *trans-cis* isomerization due to the increased hydrophilicity of the complexed AAP compared to the uncomplexed CD. Upon 405nm light exposure, the gels can expand by up to 30% in area at slightly elevated temperatures.



Visible-Light Induced Structural change AAPs

### Fabrication of photo-responsive metallogels



Reversible photo-induced gel-to-sol transition of visible – light responsive Amino Acid based Lanthanide Metallogels

This work was supported by PREM NSF# DMR1827820

# Hampton PREM Outreach Highlights

