

# Design Rules for Stable Organic Materials for Outer Space Solar Cell Applications

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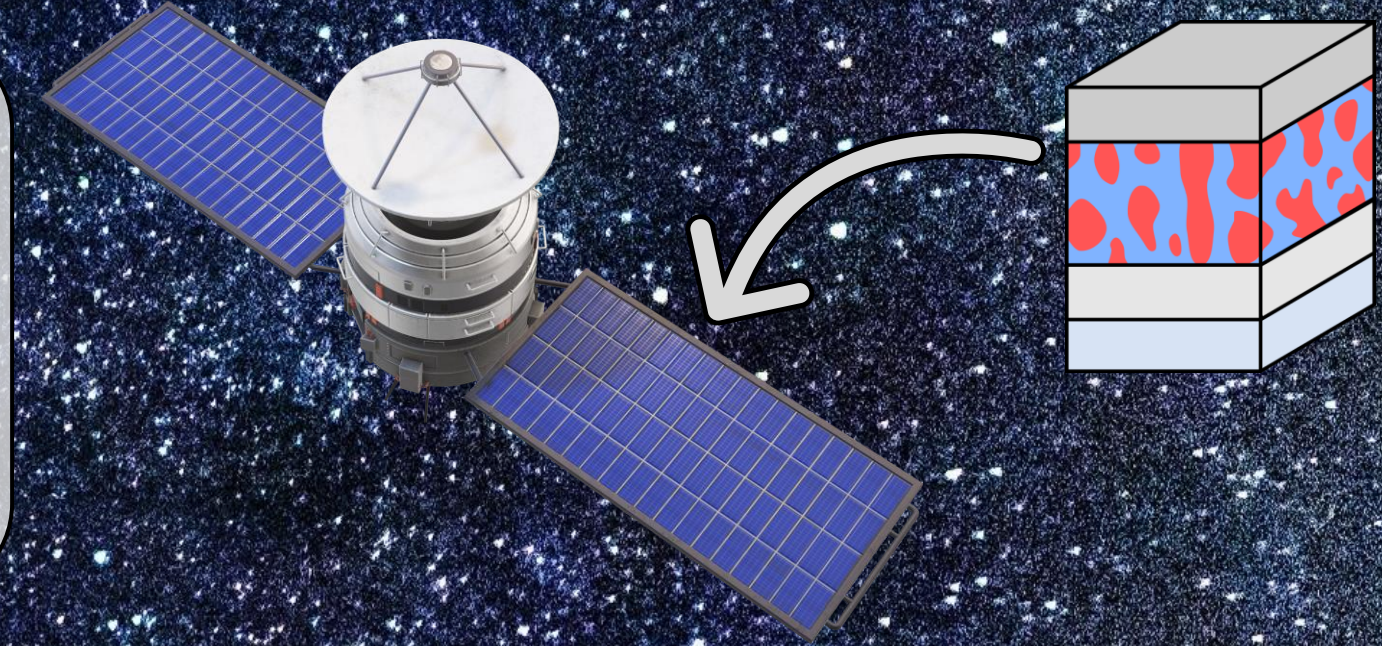
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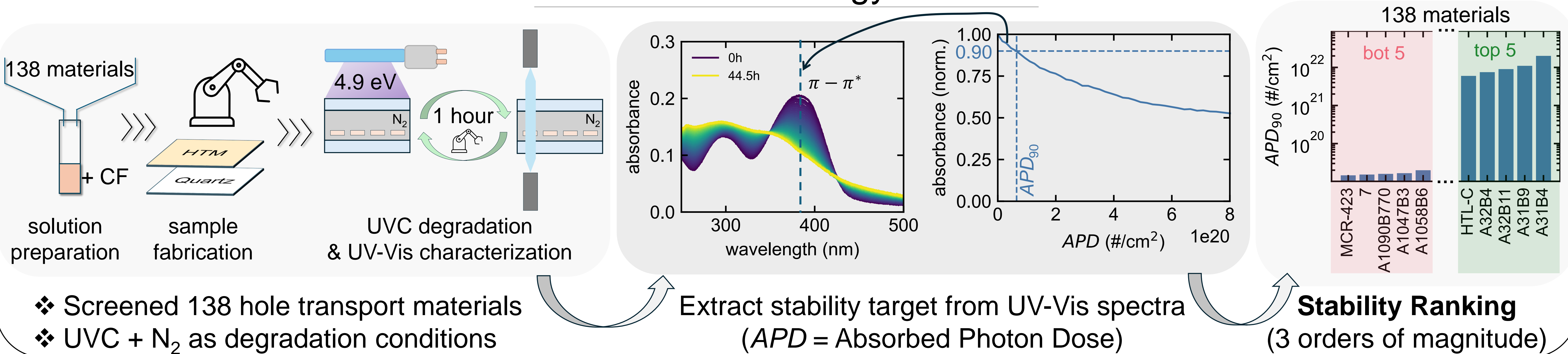
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## Motivation

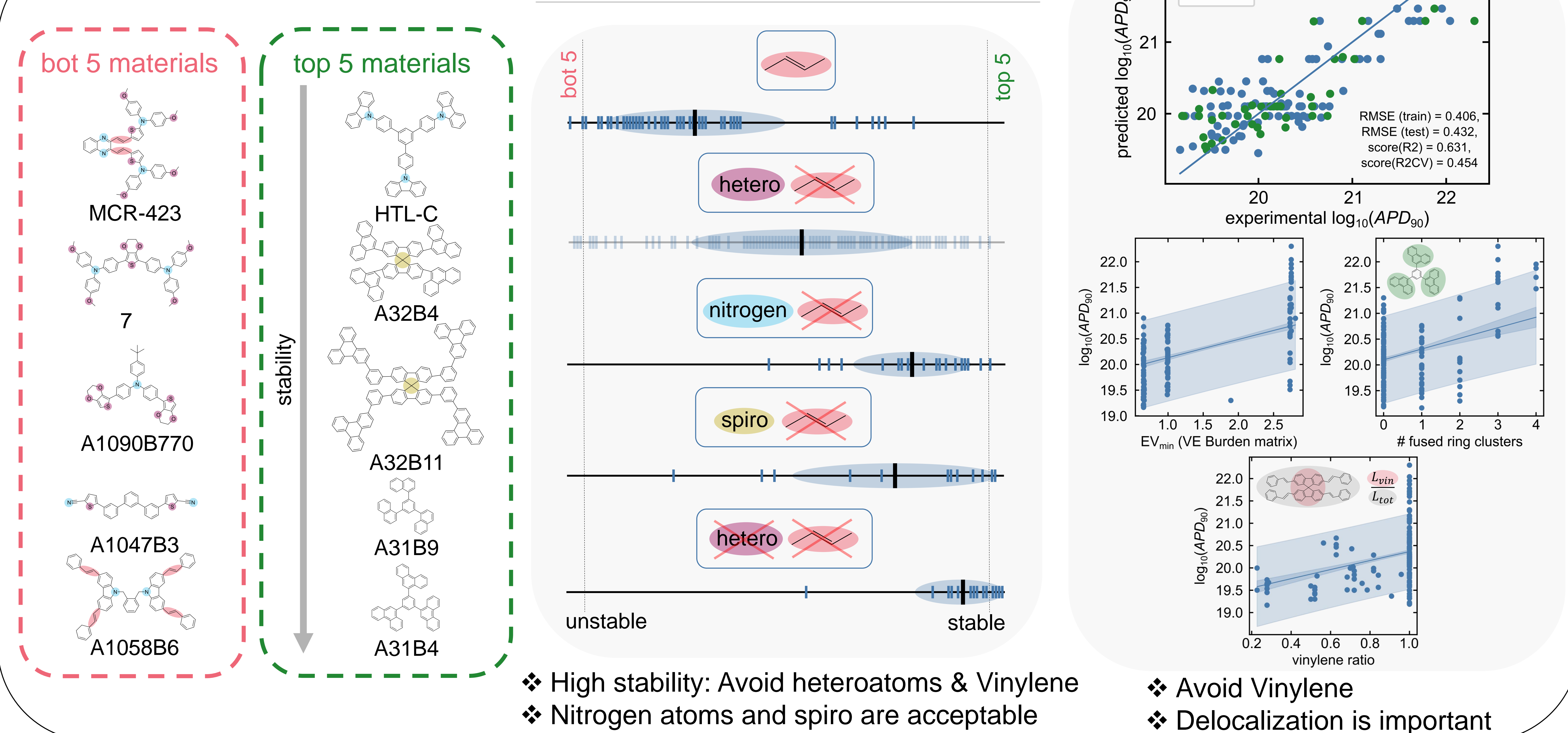
- ❖ Find Radiation Hard Organic Materials
- ❖ High-throughput screening of big material database
- ❖ Approximate space conditions in lab
- ❖ Predict Gamma-ray stability from UVC stability



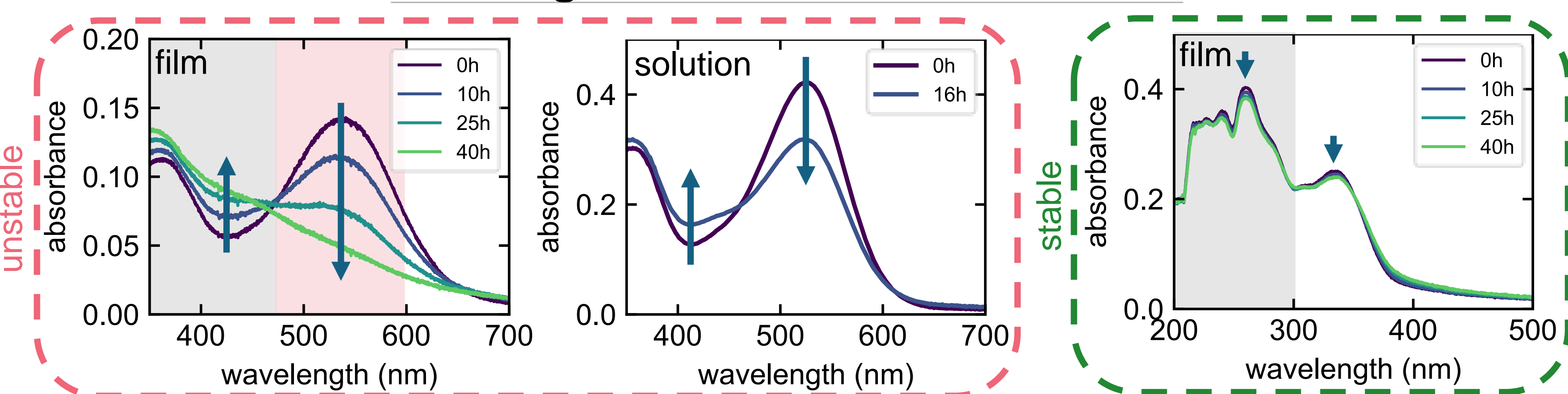
## Methodology



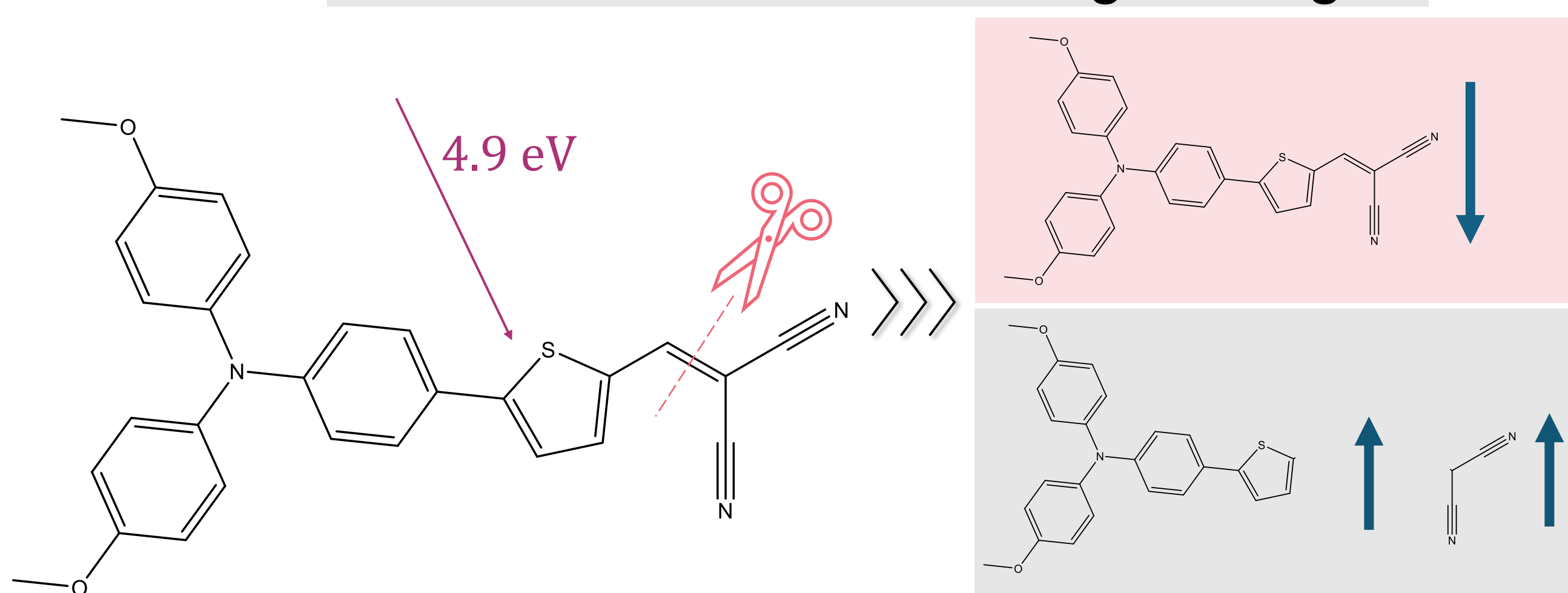
## Material Design Rules



## Degradation Mechanism

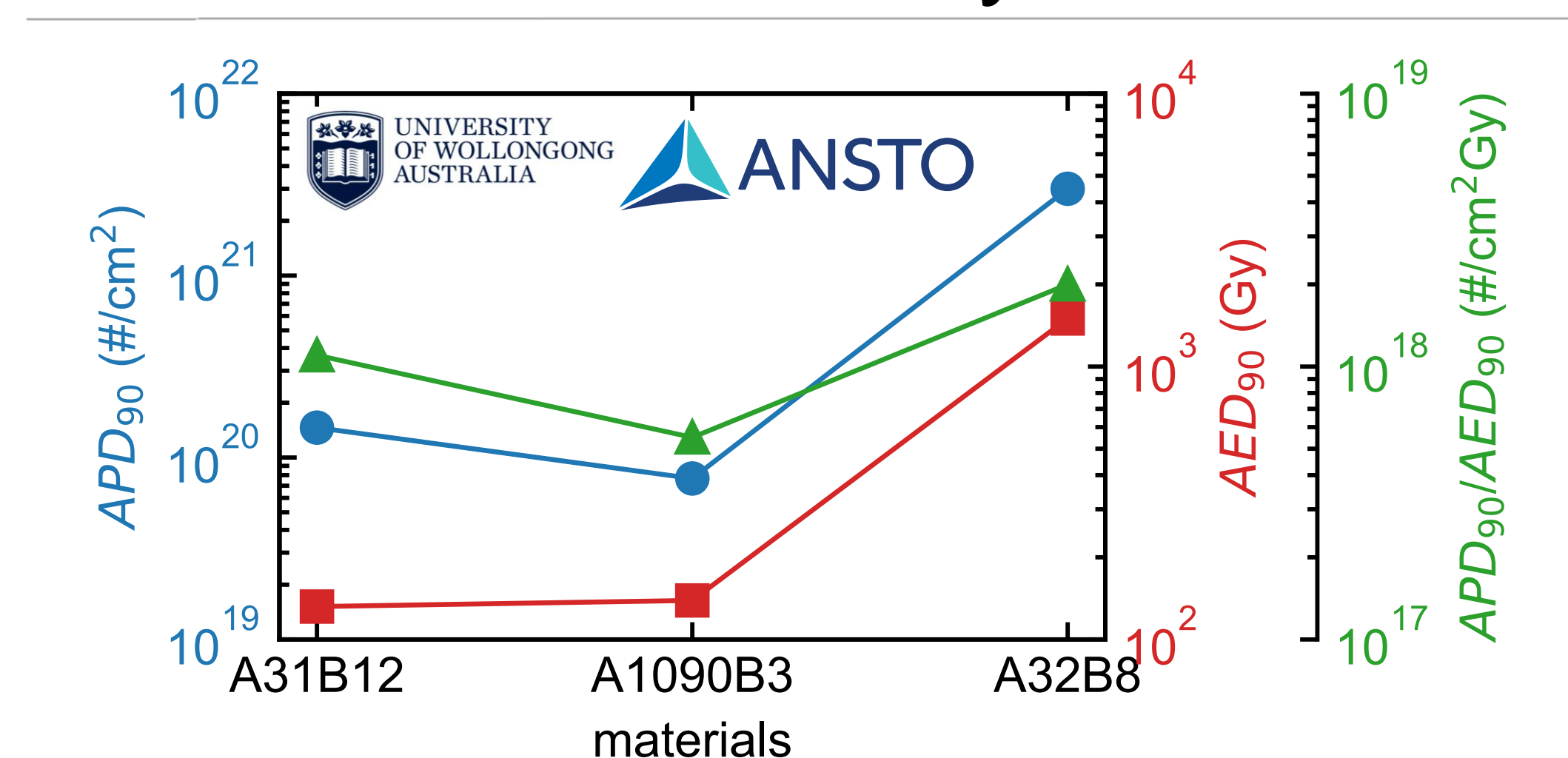


Unstable material: Absorbance is shifted to high energies → bond cleavage



When bond is broken, new molecules absorb at higher energies

## Outlook: Gamma-ray Prediction



- ❖ UVC has similar energy as Gamma 2<sup>nd</sup> e<sup>-</sup>
- ❖ Gamma and UVC stability have same trend
- ❖ Correlation factor doesn't differ much
- ❖ Results for 24 more materials soon

## Acknowledgements

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