

JEREMY A. FEURY[#], and EDWARD A. WOVCHKO, Department of Chemistry, West Virginia Wesleyan College, Buckhannon, WV, 26201. **Preparation and characterization of a TiO₂-cis photocatalyst for CO₂ reduction and utilization.**

With the overabundance of detrimental gases in the atmosphere such as carbon dioxide, efforts are being made to not only remove them but to utilize them in artificial photosynthetic pathways. Titanium dioxide nanoparticles are well-known photocatalytic materials for water splitting and CO₂ reduction. By introducing semiconductor nanocrystals, the electronic structure of the TiO₂ may be altered to improve efficiency and selectivity for synthetic routes. Wet chemistry and inert atmospheric methods were used to synthesize copper indium sulfide (CIS) quantum dots and TiO₂ nanomaterials. Characterization results from UV-Vis, fluorescence, and infrared spectroscopy will be presented. A vacuum system, high power arc lamp, and infrared spectroscopy were employed to investigate potential photosynthesis using the TiO₂-CIS in the presence of CO₂ gas and H₂O vapor. Results from these experiments will be provided.