

INSTRUMENT DESIGN AND PREPARATION OF *PARA*-HYDROGEN FOR MATRIX EXPERIMENTS

KORINA VLAHOS, *Chemistry and Biochemistry, University of Maryland, College Park, College Park, MD, USA*; EMILY K HOCKEY, *Department of Chemistry and Biochemistry, University of Maryland, College Park, College Park, MD, USA*; LEAH G DODSON, *Department of Chemistry and Biochemistry, University of Maryland, College Park, MD, USA*.

Para-hydrogen ($p\text{-H}_2$) is used as a host matrix in matrix-isolation experiments because of its unique properties to act as a quantum solid. However, $p\text{-H}_2$ is not commercially available and needs to be produced in house with a custom-built $p\text{-H}_2$ converter. Throughout this presentation, we will describe the design and building phases of the custom-built $p\text{-H}_2$ converter at the University of Maryland. Instrument drawings, schematics, and preliminary results will be presented. This talk will also explore the spectroscopic techniques that are used to both prove the enrichment of $p\text{-H}_2$ and determine the purity of $p\text{-H}_2$. The $p\text{-H}_2$ will be used in future experiments to study novel astrochemistry interactions and reactions in the interstellar medium (ISM). The production of $p\text{-H}_2$ is critical for future astrochemistry relevant experiments as its properties as a quantum solid allow us to further understand molecular properties and interactions that would be otherwise unattainable with rare-gas host matrices.