

The Possible Origin of Propylene Oxide, a Chiral Interstellar Molecule. M.J. Loeffler¹, R.L. Hudson¹, and K.M. Yocum², Astrochemistry Laboratory (Code 691), NASA Goddard Space Flight Center, Greenbelt, MD 20771 (mark.loeffler@nasa.gov), ²Department of Chemistry, Kutztown University, Kutztown, PA, 19530.

Introduction: The recent discovery of propylene oxide in the interstellar medium [1] is particularly interesting, because it is the first detection of a chiral molecule in interstellar space. Chirality, meaning that the molecule has two distinct structures that cannot be superimposed, is of interest, as terrestrial biochemistry favors one structure of the other for biological activity. As there is little laboratory data on propylene oxide under relevant astrochemical conditions, we have recently begun to investigate this molecule under such conditions to help guide current and future investigations [2]. Here we present results that show radiolysis of relevant interstellar ice analogs can produce propylene oxide at 10 K. We also estimate the yield of propylene oxide in the experiments and identify some of the new products formed. Connections are also drawn between our results and other relevant interstellar molecules, while predictions are made about several others.

References: [1] McGuire, B.A. et al. (2016) *Science*, 352, 1449-1452. [2] Hudson et al. (2017), *ApJ*, in press.