

ROTATIONAL SPECTROSCOPY: A LABORATORY FOR UNDERGRADUATE PHYSICAL CHEMISTRY

NICOLE MOON, AMANDA JO DUERDEN, G. S. GRUBBS II, *Department of Chemistry, Missouri University of Science and Technology, Rolla, MO, USA.*

While rotational spectroscopy has become a more prominent field within the past few decades, few laboratory exercises exist that introduce students at the undergraduate level to the concepts and instrumentation used within the field. Here, a physical chemistry laboratory involving the analysis of benzonitrile with a Balle-Flygare type, Fourier Transform microwave spectrometer is introduced as one such exercise. The analysis of benzonitrile is ideally suited for an undergraduate physical chemistry laboratory because it is easily carried out within one lab period and involves a comprehensive introduction into the world of rotational spectroscopy. Within this laboratory, students have the opportunity to make Gaussian calculations, accrue spectra on a research grade FTMW, and perform effective Hamiltonian fits inclusive of nuclear electric quadrupole coupling using analysis software commonly available to the spectroscopic community. The design, implementation, and students' response to this laboratory will be discussed.

