

## THE FTMW SPECTRUM OF CORANNULENE

JENS-UWE GRABOW, MELANIE SCHNELL, *Institut für Physikalische Chemie & Elektrochemie, Universität Hannover, D-30167 Hannover, Germany*; FRANCIS J. LOVAS, *Optical Technology Division, National Institute of Standards and Technology, Gaithersburg, MD 20899-8441*; ROBERT J. McMAHON, *Department of Chemistry, University of Wisconsin, Madison, WI 53706*; J. MACK, LAWRENCE T. SCOTT, *Department of Chemistry, Boston College, Chestnut Hill, MA 02467-3860*; ROBERT L. KUCZKOWSKI, *National Science Foundation, 4201 Wilson Boulevard, Arlington, VA 22230*.

For the first time in the laboratory, we have observed the rotational microwave spectrum of gas-phase corannulene ( $C_{20}H_{10}$ ). The structure of corannulene was determined by Hedberg et al. (J.Phys.Chem.A, 104, 7689 (2000)) and comprises one-third of the fullerene molecule  $C_{60}$ , the so-called bucky ball, with hydrogen atoms terminating the peripheral carbon framework, which shows  $C_{5v}$  symmetry. Essentially, corannulene is comprised of a central pentagon surrounded by five hexagon rings with carbon atoms at each apex and 10 hydrogen atoms are attached to the outer pairs of carbon atoms in the hexagons. The introduction of the pentagon causes a tessellation of hexagons to warp and the whole molecule is puckered in the shape of a scull cap, a so-called bucky bowl. For closed fullerenes and most flat polycyclic aromatic hydrocarbons (PAHs), the dipole moment is zero by symmetry, but for a cap, the permanent dipole moment can be substantial (Theor. Chem. Acc. 97, 67(1997)). The initial studies of the rotational spectrum were carried out at NIST and further measurements, including Stark effect measurements, were accomplished at the University of Hannover. Details of the measurements and analysis will be presented.