SPECTROSCOPY OF SOME N-PHENYL AMIDES. STRUCTURES AND RELATIVE STABILITIES OF THE *CIS* AND *TRANS* ISOMERS

VICTORIA P. MANEA, JOHN R. CABLE, *Department of Chemistry and Center for Photochemical Sciences, Bowling Green State University, Bowling Green, OH 43403.*

Equilibrium geometries and isomer distributions in a series of N-phenyl amides were studied using multiphoton ionization spectroscopy in a supersonic jet. The experimental data are consistent with a considerably larger population of the *trans* isomer in formanilide, although both isomers were present in the expansion. In the *cis* conformation the phenyl ring is twisted out of the plane of the amide group, while *trans*-formanilide adopts a planar geometry. Only *trans*-acetanilide was identified under the same experimental conditions. N-methyl substitution in formanilide results in different *cis* to *trans* isomer ratios, with a preference for the *cis* geometry. In addition, van der Waals clusters of formanilide and acetanilide with water were investigated and evidence of multiple binding sites was seen.