

WATER-NETWORK MEDIATED, ELECTRON INDUCED PROTON TRANSFER IN ANIONIC  $[\text{C}_5\text{H}_5\text{N}\cdot(\text{H}_2\text{O})_n]^-$  CLUSTERS: SIZE DEPENDENT FORMATION OF THE PYRIDINIUM RADICAL FOR  $n \geq 3$

ANDREW F DeBLASE, *Department of Chemistry, Purdue University, West Lafayette, IN, USA*; GARY H WEDDLE, *Department of Chemistry and Biochemistry, Fairfield University, Fairfield, CT, USA*; KAYE A ARCHER, KENNETH D. JORDAN, *Department of Chemistry, University of Pittsburgh, Pittsburgh, PA, USA*; MARK JOHNSON, *Department of Chemistry, Yale University, New Haven, CT, USA*.

As an isolated species, the radical anion of pyridine ( $\text{Py}^-$ ) exists as an unstable transient negative ion, while in aqueous environments it is known to undergo rapid protonation to form the neutral pyridinium radical [ $\text{PyH}^{(0)}$ ] along with hydroxide. Furthermore, the negative adiabatic electron affinity (AEA) of  $\text{Py}^-$  can become diminished by the solvation energy associated with cluster formation. In this work, we focus on the hydrates  $[\text{Py}\cdot(\text{H}_2\text{O})_n]^-$  with  $n = 3-5$  and elucidate the structures of these water clusters using a combination of vibrational predissociation and photoelectron spectroscopies. We show that H-transfer to form  $\text{PyH}^{(0)}$  occurs in these clusters by the infrared signature of the nascent hydroxide ion and by the sharp bending vibrations of aromatic ring CH bending.