

## A NEW LOOK AT ArOH VIA HIGH-RESOLUTION INFRARED SPECTROSCOPY<sup>a</sup>

R. TIMOTHY BONN, MARTYN D. WHEELER, and MARSHA I. LESTER,

*Department of Chemistry, University of Pennsylvania, Philadelphia, PA 19104-6323.*

An IR-UV double resonance technique has been implemented to obtain the infrared spectrum of ArOH in the vicinity of the fundamental OH stretch at 2.8  $\mu\text{m}$ . An optical parametric oscillator prepares ArOH with one quantum of OH stretch ( $\nu_{\text{OH}} = 1$ ), while an UV laser promotes ArOH ( $\nu_{\text{OH}} = 1$ ) to the excited *A* electronic state, resulting in a laser-induced fluorescence signal. The fundamental OH stretch of ArOH in its ground electronic state is observed at 3567.83  $\text{cm}^{-1}$  (band origin), shifted 0.64  $\text{cm}^{-1}$  to lower energy from that in free OH. A combination band involving both OH stretch and intermolecular bending excitation is identified 9.48  $\text{cm}^{-1}$  to higher energy. The rotational structure of the combination band reveals a large splitting between + and – parity components with the same total angular momentum in the excited bending state. The experimentally derived parity splitting will be compared with previous experimental and theoretical determinations of this parameter. The parity splitting for the excited bending state provides a direct measure of the change in the intermolecular potential when the unpaired electron of OH lies in or out of the O–H–Ar plane.

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