

Abstract Submitted
for the DAMOP07 Meeting of
The American Physical Society

Global Franck-Condon breakdown: nonresonant molecular photoionization processes¹ ALOKE DAS, DAVID HARDY, Louisiana State University, ALEJANDRO AGUILAR, A.L.D. KILCOYNE, Lawrence Berkeley National Laboratory, JOHN D. BOZEK, Stanford Synchrotron Radiation Laboratory, ERWIN D. POLIAKOFF, Louisiana State University — We report photoelectron spectroscopy results of nonresonant Franck-Condon breakdown in the photoionization of CO and ICN. Most importantly, the deviations occur over a surprisingly wide range of energies. For the case of $\text{CO}^+(X^2\Sigma^+)$, the $v^+ = 1/v^+ = 0$ vibrational branching ratio is found to vary significantly (>50%) over a 200 eV range. While it is well understood that resonances can lead to coupling between photoelectron and molecular vibration, there is little information on nonresonant sources of coupling. It appears that Cooper minima may be responsible for the observations. Moreover, for ICN, the vibrationally resolved deviations from Franck-Condon behavior are vibrationally mode-specific. Studies on alternative molecular targets are planned to see whether they exhibit photoelectron dynamics that are geometry-dependent.

¹Chemical Sciences, Geosciences and Biosciences Division, Office of Basic Energy Sciences, U. S. Department of Energy

Aloke Das
Louisiana State University

Date submitted: 05 Feb 2007

Electronic form version 1.4