PHOTODISSOCIATION OF NO ISOLATED IN SOLID PARAHYDROGEN

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The in situ photochemistry of dopant molecules isolated in solid parahydrogen (pH_2) typically differs from analogous studies in rare gas crystals for two main reasons: (1) solid pH_2 has a negligible cage effect so that photodissociation of a precursor molecule can lead efficiently to well-separated fragments, and (2) radical fragments can potentially react with the pH_2 matrix. Our group is currently studying the 193 nm photochemistry of a number of precursor molecules isolated in solid pH_2 via high-resolution FTIR spectroscopy in hopes of identifying trapped atomic species. Currently we are revisiting the photochemistry of NO in solid pH_2 that has previously been investigated by Momose and co-workers.[a] The 193 nm photodynamics of NO in rare gas matrices has also been extensively studied.[b] The studies by Momose showed that NO is photolabile at 193 nm and that the product N and O atoms react to form NH_3 and H_2O, respectively. Preliminary experiments in this laboratory show evidence for the production of the imidogen (NH) radical as well, and the most recent results and analysis will be presented.

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[a] M. Fushitani and T. Momose, *Low Temp. Phys.* **29**, 740 (2003).
[b] J. Eloranta, K. Vaskonen, H. Hakkanen, T. Kiljunen, and H. Kunttu, *J. Chem. Phys.* **109**, 7784 (1998).