Products of the Photolysis of Nitrous Acid in a Benzene Matrix

Ethan Schrum  
*Illinois Wesleyan University*

Timothy Rettich, Faculty Advisor  
*Illinois Wesleyan University*

Follow this and additional works at: [https://digitalcommons.iwu.edu/jwprc](https://digitalcommons.iwu.edu/jwprc)

[https://digitalcommons.iwu.edu/jwprc/1999/posters/4](https://digitalcommons.iwu.edu/jwprc/1999/posters/4)

This is protected by copyright and/or related rights. It has been brought to you by Digital Commons @ IWU with permission from the rights-holder(s). You are free to use this material in any way that is permitted by the copyright and related rights legislation that applies to your use. For other uses you need to obtain permission from the rights-holder(s) directly, unless additional rights are indicated by a Creative Commons license in the record and/or on the work itself. This material has been accepted for inclusion by faculty at Illinois Wesleyan University. For more information, please contact digitalcommons@iwu.edu.  
©Copyright is owned by the author of this document.
Poster Presentation 33

PRODUCTS OF THE PHOTOLYSIS OF NITROUS ACID IN A BENZENE MATRIX

Ethan Schrum and Timothy Rettich*
Department of Chemistry, Illinois Wesleyan University

The photodegradation of nitrous acid in the troposphere is an initiation step in the formation of photochemical smog. NOx emissions from internal combustion engines react with atmospheric water vapor during sundown hours to form nitrous acid. Daytime sunlight cleaves nitrous acid into OH and NO radicals, which attack hydrocarbons emitted by industry to form the constituents of photochemical smog. In order to model this process, aqueous nitrous acid was extracted into a liquid benzene matrix to form a clear solution, which was photolyzed with 365 nm radiation. The photolysis generated a yellow liquid phase and a deep red precipitate. The liquid phase products have been identified by GC-MS and HPLC analysis as p-benzoquinone, phenol, nitrobenzene, o, m, and p-nitrophenol, 1,2, 1,3, and 1,4-dinitrobenzene, 2,4-dinitrophenol, biphenyl, and 2,3, and 4-nitrobiphenyl. The red precipitate is insoluble in benzene and ether but soluble in water, methanol and acetone. 13C-NMR spectroscopy has been inconclusive in identification of the red precipitate.