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A NEW UNIMOLECULAR REAGENT FOR NITROGEN DIOXIDE ANALYSIS

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INTRODUCTION

Industrial poisoning from the oxygen compounds of nitrogen is a hazard in many industries. They may be found in the atmospheres of chemical plants manufacturing nitric acid and may occur in the welding, metal cleaning and nitration purposes industries. Nitrogen dioxide is the most toxic of the various oxides of nitrogen.

The fumes of nitrogen dioxide are extremely dangerous because of their insidious character. The bad feature of this type of poisoning is that little warning is given to the workers for the nitrogen dioxides fail to set up defensive respiratory reflexes. A concentration of 20 - 25 ppm could irritate the eye, while 150 ppm may bring about strong local irritations, especially in the respiratory organs (1). The generally allowable concentration of daily eight-hours exposures is 5 parts of nitrogen dioxides per million parts of air (2).

Many methods have been developed for the detection of nitrogen dioxide. An early method, although tedious, involves the conversion of nitrogen dioxide to nitrite and the nitration of phenoldisulfonic acid (3, 4). Another approach to this trace analysis is the Griess method (5), which utilizes the nitrite formed from nitrogen dioxide to diazotize sulfanilic acid which in turn couples with 1-naphthylamine to form an azo dye. Many variations of this method have been developed by changing the