E2-39 Comparison of two reagents for the determination of nitrogen dioxide in the atmosphere

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Of the existing standard spectrophotometric methods for the determination of atmospheric nitrogen dioxide (WHO & ASTM) Saltzman method is mostly being used. In this method nitrogen dioxide which forms a deep red coloured

azo dye with diazotising coupling reagent in the medium is measured spectrophotometrically. However, it has been observed that the stability of the colour intensity depends on environmental conditions. This introduces a considerable error in testing field samples. Therefore this study compares the Saltzman method with another method where the same azo dye is developed, at the moment of analysis, not *in situ*.

Saltzman reagent containing 0.002%, N-l-naphthyl ethylene diamine dihydrochloride (NEDA) and 0.5% sulphanilic acid in the acetic acid medium was compared with sodium arsenite reagent containing 0.1% sodium arsenite with 0.75% sulphanilic acid in 1% NaOH medium. In both methods air samples were collected using one or more 25 ml fritted impingers containing 10 ml of absorbing reagent.

The colour development takes place in the Saltzman method during the sampling period, whereas in the sodium arsenite method the colour is developed subsequently by using a colour developing reagent containing 6% oxalic acid and 0.01% NEDA. In both methods the colour was measured spectrophotometrically at 550nm with respect to their own calibration plot.

This study indicates, that more than 80% of the total nitrogen dioxide is absorbed by the first impinger and both methods are equally precise (F test,d.f.$_{1,2}$=18, p=0.05), but there is a significant difference between them (paired t-test,d.f.=7,t=0.995). However, it was shown that the ratio of the concentration obtained by the sodium arsenite method and Saltzman method immediately after sampling was about 1.75. This study reveals that the nitrite formed in the sodium arsenite medium was stable for the observed period of 3 days, whereas the colour intensity of azo dye which is formed in the Saltzman medium decreases approximately 10% per day during the observed period. Hence the above mentioned ratio further increases with time.