

## HYDRAZINE METHOD 1

Using *p*-Dimethylaminobenzaldehyde

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### INTRODUCTION

Hydrazine has been in use as an oxygen scavenger in boiler feed water for many years. It is claimed to be superior to sodium sulphite in the treatment of high pressure boilers.

### PRINCIPLE OF THE METHOD

*p*-Dimethylaminobenzaldehyde reacts specifically with hydrazine giving a yellow colour. The intensity of this colour, which is proportional to the concentration of hydrazine, is estimated by comparison with Lovibond permanent colour glass standards.

### REAGENTS REQUIRED

1. *p*-Dimethylaminobenzaldehyde Reagent

<i>p</i> -dimethylaminobenzaldehyde (See Note 1)	4.0g.
Methanol (CH <sub>3</sub> OH)	200ml.
Hydrochloric acid (HCl 36%)	20ml.

2. *Hydrochloric Acid, 5M* (Approx 600ml. conc. acid per litre)

### THE STANDARD LOVIBOND NESSLERISER DISC NOH

The disc covers the range 0 to 10 microgrammes of hydrazine (N<sub>2</sub>H<sub>4</sub>) in steps 0, 0.5, 1, 2, 3, 4, 6, 8 and 10µg. On a 10ml. sample this is equivalent to 0 to 1.0mg./l., or on a 25 ml sample this equates to:- 0 to 0.4mg./l..

### TECHNIQUE

1. Measure 10ml. or 25ml. of a fresh sample of boiler fed water (Note 2) into a 50ml. Nessler tube (Note 3).
2. Add 1ml. hydrochloric acid (reagent 2) and 10ml. *p*-dimethylaminobenzaldehyde reagent (reagent 1). Mix thoroughly.
3. Make up to the 50ml. mark with deionised water. Mix. Allow to stand for 10 minutes.
4. Measure 10ml. of reagent 1 and 1ml. of reagent 2 into a second Nessler tube. Make up to the mark with deionised water. Place this tube in the left hand compartment of the Nessleriser.
5. After the 10 minutes has elapsed, place the tube containing treated sample in the right hand compartment of the Nessleriser.
6. Using the built in light source or North daylight, match the colour of the sample against the disc, rotating the disc until a colour match is observed.
7. The reading displayed in the bottom right hand aperture of the Nessleriser gives the concentration of hydrazine in the volume of sample taken.
8. The concentration of hydrazine is  $\frac{\text{DISC READING}}{\text{SAMPLE VOLUME}}$  mg. /l.

## NOTES

1. It is essential to use a specially purified grade of p-dimethylaminobenzaldehyde for this determination, as the yellow colour of solutions prepared from ordinary grades of this material prevents correct readings being obtained. The colour of 10ml. of reagent 1 with 1ml. of reagent 2 and the volume made up to 50ml. in a Nessler cylinder with deionised water should not exceed that of the zero standard on the disc. The reagent solution should be either stored in the dark or kept in an amber glass bottle.
2. The sample must not be collected at a temperature exceeding 21°C (70°F) and an efficient cooling coil should be fitted at the sampling point if necessary, to ensure that this temperature is not exceeded.
3. The readings obtained by means of the Lovibond Nessleriser and disc are only accurate provided that the Nessleriser glasses which are used conform to the specification employed when the disc was calibrated, that is that the 50 ml calibration mark is at a height of  $113 \pm 3$ mm. measured internally.

## REVISION HISTORY

Date	Change Note	Issue
15/05/02	36/460	2
15/03/05	CA243	3