
Oxygen Scavengers

For water

(DEHA) Iron Reduction Method

Introduction

Diethylhydroxylamin (DEHA) is used as an oxygen scavenger to reduce corrosion in boilers. It is also used in photographic processes and in the manufacture of certain silicon compounds. Analytical methods to monitor DEHA concentrations have been limited to complex techniques not suitable for on-site use. Hach has developed a relatively simple test, available in both laboratory and field test kit formats.

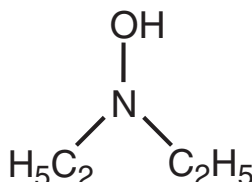


Figure 1 Chemical structure of N,N-Diethylhydroxylamine (DEHA)

Chemical reactions

DEHA reacts quantitatively with Fe³⁺ (ferric iron) and reduces it to Fe²⁺ (ferrous iron). The Fe²⁺ can then be determined by use of FerroZine™, a sensitive ferrous iron indicator.

A buffer at an optimum pH of 2.9–3.0 enhances color development. Best results are obtained if the sample temperature is 25 °C (77 °F), and with a reaction time of 10 minutes in the dark. All chemicals for this procedure are packaged in two reagents. DEHA Reagent 1 Powder Pillows combine buffer and FerroZine indicator. DEHA Reagent 2 is a liquid formulation containing a source of Fe³⁺ for the reaction. An explanation of the reaction between FerroZine and Fe²⁺ can be found in the FerroZine Method for Iron explanation.

This method is also applicable to other oxygen scavengers, such as hydroquinone, erythorbic acid (iso-ascorbic acid) methyl ethyl ketoxime and carbonylhydrazide, by use of the appropriate conversion factor.