ASTM D2194-02(2012) Standard Test Method for Concentration of Formaldehyde Solutions by HPLC

Significance and Use

4.1 This test method provides a measurement of formaldehyde content (assay) of formaldehyde solutions. The results of these measurements can be used for specification acceptance.

1. Scope

1.1 This test method covers the determination of the formaldehyde content of commercially available formaldehyde solutions ranging in concentration from 36 to 55 weight %.

1.2 For purposes of determining conformance of an observed value or a calculated value using this test method to relevant specifications, test result(s) shall be rounded off “to the nearest unit” in the last right-hand digit used in expressing the specification limit, in accordance with the rounding-off method of Practice E29.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.4 For hazard information and guidance, see the supplier's Material Safety Data Sheet.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Abstract

Sample Preparation: Formaldehyde (HCHO) is reacted with 2,4-dinitrophenylhydrazine (DNPH) to form a Schiff base (HCHO-DNPH derivatization product) which has an absorbing maximum (λmax) at 360 nm.

HPLC System: (Ctrl + Click to follow link)
Column: C8, 3-µm particle size analytical column (150 mm × 4.6 mm)
Injection Volume: 15-µL
Column temperature: 30°C
UV Wavelength: 360nm
Mobile Phase: Water–Acetonitrile (55:45, v/v)
Flow Rate: 1 mL/min
Expected retention time of the HCHO–DNPH Product: approx. 6.4 min

References: http://www.astm.org/Standards/D2194.htm
G. Lunn, L.C. Hellwig. Handbook of Derivatization Reactions for HPLC. Wiley-Interscience Publication, 1998
Wu, Pai-Wen; Chang, Chieu-Chen; Chou, Shin-Shou. Determination of formaldehyde in cosmetics by HPLC method and acetylacetone method. Journal of Food and Drug Analysis 11(1): 8-15 2003