

Cover Note:

FROM EU:

Free Formaldehyde Quantification:

Formaldehyde and related substances which liberate formaldehyde are commonly used as preservatives in cosmetic products and approved in the Directive however the presence of free formaldehyde in a product is restricted. ***Approved Methodology: High-performance liquid chromatography (HPLC) with post column derivatisation.***

EU Cosmetics Directive (76/768/EEC).

FROM CANADA:

Formaldehyde is permitted at low levels when used as a preservative in cosmetics. In liquid form, formaldehyde is referred to as methylene glycol or formalin. The terms "formaldehyde" and "methylene glycol" are often used interchangeably in toxicity studies pertaining to formaldehyde.

Health Canada continues to receive complaints of burning eyes, nose, and throat, breathing difficulties, and hair loss associated with use of this product. Health Canada believes that the reactions are being caused primarily by formaldehyde being released and inhaled during the blow drying and flat ironing stages of the treatment.

Health Canada remains concerned that elevated levels of formaldehyde in any form places people at increased risk. Possible long-term effects are also of concern to Health Canada, since formaldehyde is a known irritant, sensitizer, and is linked to cancer in humans when inhaled chronically over a long period of time. As a result, the Department has worked to stop distribution of this product in Canada.

Testing previously conducted by Health Canada found that the Brazilian Blowout Solution contained 12% formaldehyde. Health Canada has continued to analyze this product. Validated

test results confirmed that the formaldehyde releasing potential is 8.4%, ***as measured by High Performance Liquid Chromatography (HPLC).***

FROM OREGON OSHA:

Bulk Sample Analysis

The samples were also analyzed by HPLC using post column derivatization with acetyl acetone.^{41, 42, 43} This method is used in the European Union to determine formaldehyde in cosmetics. A sample was weighed and diluted to 10 milliliters in water. Depending on the final concentration the sample was diluted again 1 to 10 or 1 to 100. Analysis was performed on a reverse phase HPLC. The eluent was derivatized post column with acetyl acetone in aqueous ammonium acetate, and the presence of formaldehyde was detected at 410 nanometers. This method was used to analyze all of the samples received. It was selected because of its specificity for formaldehyde.

Air Sample Analysis

Analysis of all air samples taken was performed using NIOSH 2016.⁴⁵ Samples were collected on SKC 226-119 sorbent tubes at 0.05 to 0.2 liters per min. The 2,4-dinitrophenyl hydrazine on silica gel in the SKC 226-119 tubes reacts with any aldehydes present in the air. The contents of the tubes were placed in autosampler vials and desorbed in 2 milliliters acetonitrile. The tubes were analyzed by reverse phase High Performance Liquid Chromatography on a C18 column with a methanol/water eluent. Detection was at 353 nanometers with a diode array detector.

Other Resources

http://www.waters.com/waters/en_US/HPLC---High-Performance-Liquid-Chromatography-Beginner's-Guide/nav.htm?cid=10048919&locale=en_US

<http://www.hc-sc.gc.ca/cps-spc/cosmet-person/hot-list-critique/hotlist-liste-eng.php#tbl2>

Health Canada Advisory: http://www.hc-sc.gc.ca/ahc-asc/media/advisories-avis/2010/2010_182-eng.php

Oregon OSHA statement: http://www.orosha.org/admin/newsrelease/2010/nr2010_28.pdf
<http://www.orosha.org/pdf/hazards/2993-26.pdf>

Oregon Health & Science University's Center for Research on Occupational and Environmental Toxicology report: <http://www.ohsu.edu/xd/research/centers-institutes/croet/emerging-issues-and-alerts.cfm>

Final report: "Keratin-Based" Hair Smoothing Products and the Presence of Formaldehyde," Oregon OSHA (A Division of the Oregon Department of Consumer and Business Services and CROET at Oregon Health & Sciences University), October 29, 2010:
http://www.orosha.org/pdf/Final_Hair_Smoothing_Report.pdf

Connecticut Department of Public Health issues warning about hair straightening products:
<http://www.ct.gov/dph/cwp/view.asp?Q=468308&A=3865>