METHYLENE GLYCOL in hair straighteners

Methylene glycol is an ingredient used in some hair-straightening products. It is formed by the reaction of formaldehyde with water. Formaldehyde is a toxic substance, and since the reaction with water is reversible, products containing methylene glycol can, under some circumstances, release formaldehyde. The question is thus: is the use of methylene glycol in hair straightening products safe?

→ WHAT IS METHYLENE GLYCOL?

Dissolved in water, a molecule of formaldehyde – which is a gas at room temperature – reacts with a molecule of water to form methylene glycol. This reaction can easily be reversed in a variety of conditions. Both compounds exist in equilibrium and are constantly and rapidly transformed into each other. The rate of conversion depends on temperature, pH, concentration, and on the presence of other molecules. Therefore, although chemically they are two different molecules, the Scientific Committee on Consumer Safety considered that methylene glycol, in a solution, is equivalent to formaldehyde.

→ HOW ARE CONSUMERS EXPOSED TO METHYLENE GLYCOL?

Currently, methylene glycol is used in hair straightening products, with concentrations that may reach up to 9.6 % in some cases. This is much higher than the limit set for formaldehyde, which is 0.2%. The use of those products also involves heat and application with a straightening iron or a blow dryer, which can release formaldehyde vapours. Hair straighteners are usually used in hair dressers' shops, and some hair professionals can thus potentially be exposed significantly to those formaldehyde vapours.

→ WHAT ARE THE POTENTIAL EFFECTS ON HEALTH OF BEING EXPOSED TO FORMALYDEHYDE?

Formaldehyde irritates the eyes, the skin and the respiratory tract when inhaled. Inhalation exposure to high concentrations of formaldehyde can induce cancers in the nose and throat in experimental animals. Exposure to formaldehyde has also been linked to leukaemia in humans. Based on the available scientific evidence, the International Agency for Research on Cancer (IARC) of the World Health Organisation (WHO) has classified formaldehyde as a potential human carcinogen.

→ IS THE USE OF METHYLENE GLYCOL IN HAIR STRAIGHTENERS SAFE?

Currently, there are restrictions on the use of formaldehyde is cosmetics, but none of these explicitly mention methylene glycol in hair straightening products. The scientific opinion of the Scientific Committee on Consumer Safety is that when methylene glycol is used in hair straightening products at a concentration of 0.2%, the amount of formaldehyde vapour released may exceed the WHO indoor air quality guideline of 0.1 mg/m^3, and pose a health risk. Therefore, the Committee concluded that the use of methylene glycol hair straightening products at levels as low as the currently allowed concentration limit of 0.2 % for formaldehyde is not considered to be safe.

This fact sheet is based on the scientific opinion "**Methylene glycol**" adopted on 26-27 June 2012 by the independent European Scientific Committee on Consumer Safety.

The detailed and nuanced view of the European Scientific Committee on Emerging and Newly Identified Health Risks on this issue is available at:

http://ec.europa.eu/health/scientific_committees/emerging/docs/sccs_o_097.pdf

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