Methylisothiazolinone and Methylchloroisothiazolinone

Methylisothiazolinone (MIT) and Methylchloroisothiazolinone (CMIT) may be hard to pronounce, but they can be even harder on the body. These common preservatives are found in many liquid personal care products, and have been linked to lung toxicity,[1] allergic reactions, and possible neurotoxicity.[2]

WHAT ARE METHYLISOTHIAZOLINONE and METHYLCHLOROISOTHIAZOLINONE?

Methylisothiazolinone (MIT) and Methylchloroisothiazolinone (CMIT) are widely used preservatives found in liquid cosmetic and personal care products.[3][4] Both chemicals inhibit bacterial growth in cosmetic products on their own, but they are most commonly used as a mixture in products.[5]

Found In

- Shampoo
- Conditioner
- Hair color
- Body wash
- Lotion
- Sunscreen
- Mascara
- Shaving cream
- Baby lotion
- Baby shampoo
- Hairspray
- Makeup remover
- Liquid soaps and detergents.

What to look for on the label

- Methylisothiazolinone (MIT): 2-methyl-4-isothiazoline-3-one, Neolone 950 preservative, MI, OriStar MIT and Microcare MT.
- Methylchloroisothiazolinone (CMIT): 5-Chloro-2-methyl-4-isothiazolin-3-one and MCI.

Health Concerns

Organ System Toxicity: Rats exposed to highly concentrated MIT (over 50%) showed a range of symptoms, including significant body weight gain and death. Autopsies revealed that death was due to reddened lungs and swollen intestines.[6] This may be

a concern to factory workers who are exposed to high concentrations of MIT. Currently, there are no National Institute for Occupational Safety and Health (NIOSH) guidelines to limit MIT/CMIT exposure in the workplace.[7][8]

Allergies: Methylisothiazolinone (MIT) and Methylchloroisothiazolinone (CMIT) are two of the most predominant contact allergens found in cosmetic products.[9] In a clinical study, researchers found that dermal irritation most commonly occurs in products with CMIT and MIT/CMIT mixtures, but is not as common in products with only MIT.[10][11] The American Contact Dermatitis Society named MIT Allergen of the Year for 2013 due to the skin sensitization resulting from dermal exposure to it.[12][13]

Debate exists about the concentrations of MIT/CMIT that trigger an allergic reaction, and harmful effects have been found ranging from 7.5 to 100 parts-per-million.

Neurotoxicity: In vitro cell studies on Methylisothiazolinone (MIT) showed signs of neurotoxicity when cerebral cortex cells were exposed to liquid MIT.[14] However, animal studies did not find significant signs of neurotoxicity when rodents were exposed to MIT through drinking water.[15]

Vulnerable Populations

Workers (https://www.safecosmetics.org/population/workers/)

Regulations

Europe, along with the European Society of Contact Dermatitis (ESCD), recommends that MIT be discontinued from use in leave-on skin products.[16]

How to Avoid?

If you are allergic, read labels and avoid products with Methylisothiazolinone (MIT) or Methylchloroisothiazolinone (CMIT). Especially avoid products with a mixture of CMIT and MIT. If you are not allergic, MIT and CMIT are among the safer preservatives with regard to long-term chronic health effects.

Explore other Chemicals

Ethoxylated Ingredients (https://www.safecosmetics.org/chemicals/ethoxylated-ingredients/)

Acrylates (https://www.safecosmetics.org/chemicals/acrylates/)

Phenoxyethanol (https://www.safecosmetics.org/chemicals/phenoxyethanol/)

Carbon Black (https://www.safecosmetics.org/chemicals/carbon-black/)

Polyacrylamide (https://www.safecosmetics.org/chemicals/polyacrylamide/)

Nail Polish Removers (https://www.safecosmetics.org/chemicals/nail-polish-removers/)

View All Chemicals of Concern > (/chemicals/)

Looking for a Safer Alternative?

Use Clearya's app to find non-toxic products! Clearya alerts you to toxics and helps you find safe products.

Clearya (https://www.clearya.com/)

Visit Clearya > (https://www.clearya.com/)

Your Action Helps

Together, we can make beauty safer for all.

Take Action Today!

(/take-action/)

FILTER BY:

By Population

By Products

By Health Concerns

References

[1] Rohm & Haas (2002). Acute Inhalation toxicity study in rate (methylisothiazolinone 53.52% active ingredient). Rohm & Haas Chemicals, LLC Report, 06R-1002.

[2] Burnett, C. L., Bergfeld, W. F., Belsito, D. V., Klaassen, C. D., Marks, J. G., Shank, R. C., ... & Andersen, F. A. (2010). Final report of the safety assessment of methylisothiazolinone. International journal of toxicology, 29(4 suppl), 187S-213S.

[3] Methylchloroisothiazolinone. Available Online: http://www.ewg.org/skindeep/ingredient/703924/METHYLCHLOROISOTHIAZOLINONE/ (http://www.ewg.org/skindeep/ingredient/703924/METHYLCHLOROISOTHIAZOLINONE/). Accessed April 26, 2022.

[4] Methylisothiazolinone and Methylchloroisothiazolinone Available Online: http://www.cosmeticsinfo.org/ingredient/methylisothiazolinone-and-methylchloroisothiazolinone (https://www.cosmeticsinfo.org/ingredients/methylchloroisothiazolinone-and-methylisothiazolinone/). Accessed April 26, 2022.

[5] Burnett, C. L., Bergfeld, W. F., Belsito, D. V., Klaassen, C. D., Marks, J. G., Shank, R. C., ... & Andersen, F. A. (2010). Final report of the safety assessment of methylisothiazolinone. International journal of toxicology, 29(4 suppl), 187S-213S.

[6] Rohm & Haas (2002). Acute Inhalation toxicity study in rate (methylisothiazolinone 53.52% active ingredient). Rohm & Haas Chemicals, LLC Report, 06R-1002.

[7] EWG. Methylchloroisothiazolinone. https://www.ewg.org/skindeep/ingredients/703924-methylchloroisothiazolinone/ (https://www.ewg.org/skindeep/ingredients/703924-methylchloroisothiazolinone/). Accessed April 26, 2022.

[8] NIOSH Methylisothiazolinone Guidelines Accessed Online: https://www.cir-safety.org/sites/default/files/MI_MCI.pdf (https://www.cir-safety.org/sites/default/files/MI_MCI.pdf). Accessed April 26, 2022.

[9] Lundov, M. D., Krongaard, T., Menné, T. L., & Johansen, J. D. (2011). Methylisothiazolinone contact allergy: a review. British Journal of Dermatology, 165(6), 1178-1182.

[10] Burnett, C. L., Bergfeld, W. F., Belsito, D. V., Klaassen, C. D., Marks, J. G., Shank, R. C., ... & Andersen, F. A. (2010). Final report of the safety assessment of methylisothiazolinone. International journal of toxicology, 29(4 suppl), 187S-213S.

[11] Lundov, M. D., Krongaard, T., Menné, T. L., & Johansen, J. D. (2011). Methylisothiazolinone contact allergy: a review. British Journal of Dermatology, 165(6), 1178-1182.

[12] Castanedo-Tardana, M.P., & Zug, K.A. (2013). Methylisothiazolinone. Dermatitis, 24(1), 2-6.

[13] Cosmetic Ingredient Review Expert Panel (1992). Final Report on the Safety Assessment of Methylisothiazolinone and Methylchloroisothiazolinone. Journal of the American College of Toxicology, 11(1).

[14] Burnett, C. L., Bergfeld, W. F., Belsito, D. V., Klaassen, C. D., Marks, J. G., Shank, R. C., ... & Andersen, F. A. (2010). Final report of the safety assessment of methylisothiazolinone. International journal of toxicology, 29(4 suppl), 187S-213S.

[15] Burnett, C. L., Bergfeld, W. F., Belsito, D. V., Klaassen, C. D., Marks, J. G., Shank, R. C., ... & Andersen, F. A. (2010). Final report of the safety assessment of methylisothiazolinone. International journal of toxicology, 29(4 suppl), 187S-213S.

[16] Cosmetics Europe: the personal care association. Recommendation. Brussels, 12 December 2013.

campaigns (/take-action/campaign/)
individuals (/take-action/)
businesses (/business/)
press (/take-action/media/)

get the facts

chemicals of concern (/chemicals/)
products of concern (/products/)
laws and regulations (/resources/regulations/)
tips (https://www.safecosmetics.org/resources/safe-cosmetics-tips/)

connect

(http://facebook.com/safecosmetics)
(http://twitter.com/SafeCosmetics)
(http://instagram.com/safecosmetics)

1388 Sutter Street, Suite 901
San Francisco, CA 94109-5400