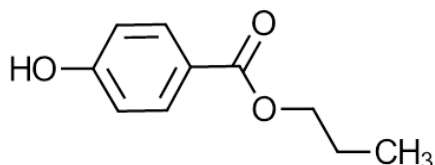
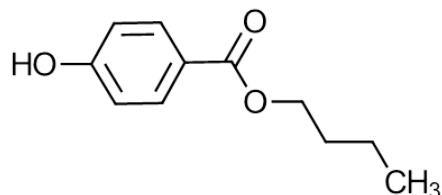


Parabens

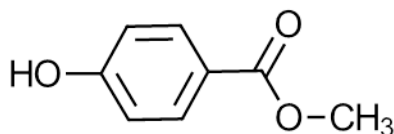
Propyl Paraben (CAS 94-13-3)



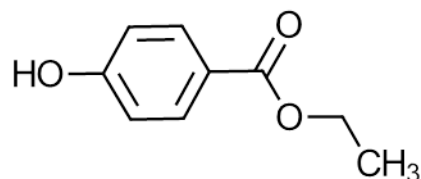
Butyl Paraben (CAS 94-26-8)



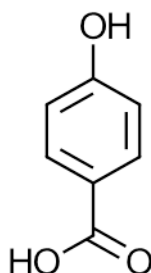
Methyl Paraben (CAS 99-76-3)



Ethyl Paraben (CAS 120-47-8)



Para-hydroxybenzoic acid (CAS 99-96-7)



Summary of Health Effects

Parabens can affect the way hormones are made in the bodies of humans and animals.

How are parabens used?

Parabens are widely used as preservatives, mostly in personal care products such as shampoo, lotion and cleansers.¹

Toxicity: What are the health effects?

Paraben is the general name used to describe esters of para-hydroxybenzoic acid (PBHA).² PHBA is a common metabolite of parabens.^{3,4}

All five of the above-listed parabens are on the European Union list of potential Category 1 endocrine disruptors.⁵ Estrogenic effects increase with chain length and with branching of the alkyl chain.⁶ Parabens are thought to show “weak” estrogenic effects. However, full agonist responses were seen with significantly high concentrations of paraben exposure.⁴

A study on exposure to paraben mixtures looked at combinations of parabens as well as different parabens paired with endogenous estradiol (E₂) exposure. The study confirmed

the hypothesis that paraben mixtures exhibit additive effects, and that parabens combined with E₂ also exhibit additive effects.⁴

In a 10-week study of butyl paraben's effects on the reproductive system of male mice, adverse effects observed in the high dose groups included increased epididymis weight compared to controls, decreased sperm production, and decreased serum testosterone.⁷ Notably, the doses administered in this study were below the accepted daily intake for Japan and the European Union.

Exposure: How can a person come in contact with them?

A person can come in contact with parabens through their skin.¹

According to the Food & Drug Administration, parabens are “among the most commonly used preservatives in cosmetic products” with

methyl paraben, propyl paraben, and butyl paraben as the most often used.² The Danish Environmental Protection Agency has detected all five parabens in various children's toys and personal care products.⁵

The 2015 National Health and Nutrition Examination Survey (NHANES) data show all four parabens (did not test for PHBA) detected in urine samples from the general U.S. population in the following percentages⁸:

- Methyl Paraben – 99% of U.S. population
- Propyl Paraben – 96% of the U.S. population
- Butyl Paraben – 69% of the U.S. population
- Ethyl Paraben – 58% of the U.S. population

Urinary concentrations were higher in women than men, especially for propyl paraben and methyl paraben, for which the geometric mean levels were seven times higher and three times higher, respectively.³

References

1. Centers for Disease Control and Prevention National Biomonitoring Program (2013). *Biomonitoring summary – parabens*. Retrieved from www.cdc.gov/biomonitoring/Parabens_BiomonitoringSummary.html
2. US Food and Drug Administration (2007). *Cosmetics products & ingredients; Parabens*. Retrieved from www.fda.gov/cosmetics/productsingredients/ingredients/ucm128042.htm
3. Calafat, A.M., Ye, W., Wong, L.Y., Bishop, A.M., Needham, L.L. (2010). Urinary concentrations of four parabens in the U.S. population: 2005-2006. *Environmental Health Perspectives*, 118, 679-85. Retrieved from www.ncbi.nlm.nih.gov/pubmed/20056562
4. VanMeeuwen, J.A., van Son, O., Piersma, A.H., de Jong, P.C., van den Berg, M. (2008). Aromatase inhibiting and combined estrogenic effects of parabens and estrogenic effects of other additives in cosmetics. *Toxicology and Applied Pharmacology*, 230, 372-382. Retrieved from www.ncbi.nlm.nih.gov/pubmed/18486175
5. Danish Ministry of the Environment, Danish Environmental Protection Agency. *The EU list of potential endocrine disruptors*. Retrieved from eng.mst.dk/chemicals/chemicals-in-products/endocrine-disruptors/the-eu-list-of-potential-endocrine-disruptors/
6. Smith, K.W., Souter, I., Dimitriadis, I., Ehrlich, S., Williams, P.L., Calafat, A.M., Hauser, R. (2013). Urinary paraben concentrations and ovarian aging among women from a fertility center. *Environmental Health Perspectives*, 121, (11-12), 1299-305. Retrieved from www.ncbi.nlm.nih.gov/pubmed/23912598
7. Oishi, S. (2002). Effects of butyl paraben on the male reproductive system in mice. *Archives of Toxicology*, 76(7), 423–9. Retrieved from www.ncbi.nlm.nih.gov/pubmed/12111007

8. Centers for Disease Control and Prevention (2015). *Fourth report on human exposure to environmental chemicals, updated tables, (February, 2015)*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. Retrieved from www.cdc.gov/exposurereport/