Polytetrafluoroethylene (PTFE, Aka Teflon®)

Teflon® in your makeup? Yuck. This non-stick ingredient and other fluorinated compounds have been associated with delayed menstruation, later breast development and cancer.

WHAT ARE FLUORINATED COMPOUNDS?

Fluorinated compounds are ingredients built around the element fluorine, a halogen element, with properties similar to chlorine and bromine, which are common in flame retardant chemicals.

Fluorinated compounds are extremely stable and as a result do not break down in the environment. They have been found in remote regions of the world, including the polar ice caps.[2]

Polytetrafluoroethylene (PTFE) appears to be the most common fluorinated compound in cosmetics. It is used most widely in anti-aging products and cosmetics, likely because it provides a smooth, sleek finish. PTFE is trademarked as Teflon®, for use in non-stick cookware.

PTFE is generated using another fluorinated compound, perfluorooctonoic acid (PFOA), which may leave residual amounts of PFOA in the final ingredient.[3] The US EPA initiated the PFOA stewardship program to reduce PFOA residues in consumer products.[4] While research suggests that most PFOA exposure results from its use in food contact items, indirect exposure from consumer products is also likely.[5] PFOA in food contact materials may be as high as 300 ppb (in popcorn bags); but to our knowledge, no studies have yet assessed PFOA contamination in cosmetics containing PTFE.

Found In

- Foundation
- Pressed powder
- Loose powder
- Bronzer
- Blush
- Eye shadow
- Mascara
- Shave gel
- Lip balm
- Anti-aging lotion

What to look for on the label

- Polytetrafluoroethylene (PTFE)
- Polyperfluoromethylisopropyl Ether
- DEA-C8-18 Perfluoroalkylethyl Phosphate
- Teflon

Health Concerns

Potential contamination with perfluorooctonoic acid (PFOA) which is associated with cancer; mammary cancer; reproductive toxicity, endocrine disruption and environmental bioaccumulation and persistence

The International Agency for Research on Cancer reviewed the research on PTFE, and determined the current data was inconclusive with regard to PTFE's potential to cause cancer. However, a wide-ranging literature has linked PFOA, which can be a contaminant of PTFE-containing consumer products, to health effects. In addition to the specific health effects from PFOA's, researchers have found evidence that exposures to fluorinated compounds may increase the carcinogenicity of other chemicals when exposures occur together.[6]

PFOA has been found in body fluid samples from 99.7 percent of the U.S. adults.[7] Other studies have found PFOA in blood serum samples taken from adults from nine countries on four continents,[8] and an additional study found PFOA in every one of the umbilical cord blood samples from newborns in Baltimore.[9] Higher levels of the chemical in cord blood were associated with both lower birth weight and smaller size, indicating an effect of PFOA on prenatal development.[10]

Cancer: The International Agency for Research on Cancer has designated PFOA as a possible carcinogen. Changes have been observed in mammary gland development in animals,[11],[12] which may have implications for breast cancer risk in exposed girls.[13] The mammary gland may be especially sensitive to PFOA exposure, and both prenatal and early postnatal exposure may lead to concerning changes in mammary gland development.[14]

One study found elevated levels of fluorinated compounds in Greenland Inuit women with breast cancer compared to Inuit women without breast cancer.[15] A study of highly contaminated regions of Ohio and West Virginia found elevated levels of testicular, prostate, kidney and ovarian cancers and non-Hodgkin's lymphoma among individuals with higher exposures to PFOA.

Endocrine Disruption: PFOA exerts effects on the endocrine system, disruptingestrogen receptors,[16] thyroid receptors[17],[18], steroid hormones[19] , and male testosterone levels.[20] Another study found further evidence that PFOA can act as an estrogen on its

own, but this study also found that in the presence of the natural estrogen, estradiol, PFOA acted as an anti-estrogen.[21]

Higher concentrations of PFOA and a related compound perfluorooctane sulfanate (PFOS) were associated with current thyroid disease among US adults.[22]

Delayed Puberty: In southeastern Ohio, adolescent girls with higher levels of PFOA in their blood, were more likely to have delayed onset of menstruation.[23] Another study of Ohio girls demonstrated that exposures to higher levels of PFOA were associated with later breast development.[24] While earlier breast development is a known risk factor for breast cancer, these data support a potential endocrine-disrupting effect of PFOA, which may lead to other health effects later in life.

Reproductive Toxicity: PFOA is a known developmental toxicant.[25] PFOA exposure in utero leads to reduced weight gain during lactation, delayed sexual maturation and death in rodents.[26] In humans, PFOA exposure was associated with pregnancy-induced hypertension (high-blood pressure), and PFOS was associated with reduced birth-weight in full-term infants.[27] Higher levels of the chemical in cord blood were associated with both lower birth weight and smaller size, indicating an effect of PFOA on prenatal development.[28] In a novel study of PFOA exposures among pregnant women in an electronic waste recycling area in China, mothers living in the area had higher PFOA levels than mothers in other areas; and exposures were associated with delayed physical development and adverse birth outcomes.[29]

Other effects Both PFOA and PFOS have been associated with changes to the immune response, including inflammation.[30] Research does not suggest an association between early life PFOA exposure and obesity in adulthood[31] or Type II diabetes.[32]

Vulnerable Populations

Babies & Children (https://www.safecosmetics.org/population/babies-children/), Pregnant Women (https://www.safecosmetics.org/population/pregnant-women/), Teenagers (https://www.safecosmetics.org/population/teenagers/)

Regulations

PFOA: US EPA set a provisional health advisory for levels above .4 ppb in drinking water. [1]

How to Avoid?

To avoid PFOA exposure from personal care products, skip products with polyperfluoromethylisopropyl ether, polytetrafluoroethylene, DEA-C8-18 perfluoroalkylethyl phosphate or Teflon® on the label.

Explore other Chemicals

Lead And Other Heavy Metals (https://www.safecosmetics.org/chemicals/lead-and-other-heavy-metals/)

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

Ethanolamine Compounds (MEA, DEA, TEA And Others) (https://www.safecosmetics.org/chemicals/ethanolamine-compounds/)

Preservatives (https://www.safecosmetics.org/chemicals/preservatives/)

Talc (https://www.safecosmetics.org/chemicals/talc/)

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