



David  
Suzuki  
Foundation



## BACKGROUND

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# THE “DIRTY DOZEN” INGREDIENTS INVESTIGATED IN THE DAVID SUZUKI FOUNDATION SURVEY OF CHEMICALS IN COSMETICS

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BHA and BHT .....	p. 2
Coal tar dyes.....	p. 3
DEA, cocamide DEA and lauramide DEA .....	p. 4
Dibutyl phthalate.....	p. 5
Formaldehyde-releasing preservatives .....	p. 6
Parabens .....	p. 7
Parfum .....	p. 8
PEGs .....	p. 10
Petrolatum .....	p. 11
Siloxanes .....	p. 12
Sodium laureth sulfate .....	p. 13
Triclosan .....	p. 14
Notes.....	p. 15

# BHA and BHT

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## Use in Cosmetics

BHA (butylated hydroxyanisole) and BHT (butylated hydroxytoluene) are closely related synthetic antioxidants used as preservatives in lipsticks and moisturizers, among other cosmetics. They are also widely used as food preservatives.

## Health and Environmental Hazards

BHA and BHT can induce allergic reactions in the skin.<sup>1</sup> The [International Agency for Research on Cancer](#) classifies BHA as a possible human carcinogen.<sup>2</sup> The [European Commission on Endocrine Disruption](#) has also listed BHA as a Category 1 priority substance, based on evidence that it interferes with hormone function.<sup>3</sup>

Long-term exposure to high doses of BHT is toxic in mice and rats, causing liver, thyroid and kidney problems and affecting lung function and blood coagulation.<sup>4</sup> BHT can act as a tumour promoter in certain situations.<sup>5</sup> Limited evidence suggests that high doses of BHT may mimic estrogen,<sup>6</sup> the primary female sex hormone, and prevent expression of male sex hormones,<sup>7</sup> resulting in adverse reproductive affects.

Under the Convention for the Protection of the Marine Environment of the North-East Atlantic, BHA is listed as a chemical of potential concern, noting its toxicity to aquatic organisms and potential to bioaccumulate.<sup>8</sup> Likewise, a United Nations Environment Program assessment noted that BHT had a moderate to high potential for bioaccumulation in aquatic species (though the assessment deemed BHT safe for humans).<sup>9</sup>

## Regulatory Status

The use of BHA and BHT in cosmetics is unrestricted in Canada, although Health Canada has categorized BHA as a “high human health priority” on the basis of carcinogenicity and BHT as a “moderate human health priority”. Both chemicals have been flagged for future assessment under the government’s [Chemicals Management Plan](#).

International regulations are stronger. The European Union prohibits the use of BHA as fragrance ingredient in cosmetics. The State of California requires warning labels on products containing BHA, notifying consumers that this ingredient may cause cancer.

## **Coal Tar Dyes: p-phenylenediamine and colours listed as “CI” followed by a five digit number <sup>a</sup>**

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### **Use in Cosmetics**

**Coal tar-derived colours** are used extensively in cosmetics, generally identified by a five-digit Colour Index (CI) number. The U.S. colour name may also be listed (e.g., “FD&C Blue No. 1” or “Blue 1”). **P-phenylenediamine** is a particular coal tar dye used in many hair dyes. Darker hair dyes tend to contain more phenylenediamine than lighter colours.

### **Health and Environmental Hazards**

Coal tar is a mixture of many chemicals, derived from petroleum. Coal tar is recognized as a human carcinogen and the main concern with individual coal tar colours (whether produced from coal tar or synthetically) is their potential to cause cancer.<sup>10</sup> As well, these colours may be contaminated with low levels of heavy metals and some are combined with aluminum substrate. Aluminum compounds and many heavy metals are toxic to the brain.<sup>11</sup> Some colours are not approved as food additives, yet they are used in cosmetics that may be ingested, like lipstick. (In the U.S. colour naming system, “FD&C” indicates colours approved by the U.S. Food and Drug Administration for use in foods, drugs and cosmetics. “D&C” colours are not approved for use in food.)

P-phenylenediamine has been found to be carcinogenic in laboratory tests conducted by the U.S. National Cancer Institute and National Toxicology Program.<sup>12</sup> A review of the epidemiologic literature confirmed statistically significant associations between hair dye use and development of several types of cancer although the authors concluded that the evidence was insufficient to determine that the hair dyes had caused the cancers.<sup>13</sup> A separate study found that women who used hair dyes – especially over extended periods – had an increased risk of developing non-Hodgkin's lymphoma (cancer of the lymph system).<sup>14</sup> There is conflicting evidence, however, with other research suggesting no strong association between cancer and hair dye use.<sup>15</sup> The [International Agency for Research on Cancer](#) concluded that personal use of hair dyes is currently “not classifiable as to its carcinogenicity in humans.”<sup>16</sup> The European Union classifies p-phenylenediamine as toxic (in contact with skin, by inhalation, or if swallowed) and as very toxic to aquatic organisms, noting that it may cause long-term adverse effects in the aquatic environment.<sup>17</sup>

### **Regulatory Status**

Several coal tar dyes are prohibited on Health Canada's Cosmetic Ingredient Hotlist and Canada's *Cosmetic Regulation* prohibit all but seven of these colours in eye makeup and other products used in the area of the eye. However, dozens of coal tar-derived colours are still widely used in other cosmetics. Some have been flagged for future assessment under the government's [Chemicals Management Plan](#).

P-phenylenediamine is permitted only in hair dyes and must be accompanied by a warning that the product “contains ingredients that may cause skin irritation on certain individuals” and if used near the eyes “may cause blindness.”<sup>18</sup>

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<sup>a</sup> In addition to coal tar dyes, natural and inorganic pigments used in cosmetics are also assigned Colour Index numbers (in the 75000 and 77000 series, respectively).

## DEA, cocamide DEA and lauramide DEA

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### Use in Cosmetics

DEA (diethanolamine) related ingredients are used to make cosmetics creamy or sudsy, or as a pH adjuster to counteract the acidity of other ingredients. They are mainly found in soaps, cleansers and shampoos.

### Health and Environmental Hazards

DEA-related ingredients may contain low residual levels of DEA,<sup>19</sup> which the European Union classifies as harmful on the basis of danger of serious damage to health from prolonged exposure.<sup>20</sup> DEA can also react with nitrites in cosmetics to form nitrosamines, which the [International Agency for Research on Cancer](#) classifies as a possible human carcinogen.<sup>21</sup> Nitrites are sometimes added to products as anti-corrosive agents or can be present as contaminants. The degradation of some chemicals used as preservatives in cosmetics can release nitrites when the product is exposed to air.<sup>22</sup>

In laboratory experiments, exposure to high doses of DEA-related ingredients has been shown to cause liver cancers and precancerous changes in skin and thyroid.<sup>23</sup> These chemicals can also cause mild to moderate skin and eye irritation.<sup>24</sup>

The Danish Environmental Protection Agency classifies cocamide DEA as hazardous to the environment because of its acute toxicity to aquatic organisms and potential for bioaccumulation.<sup>25</sup>

### Regulatory Status

DEA itself is prohibited on Health Canada's Cosmetic Ingredient Hotlist,<sup>26</sup> but the use of DEA-related ingredients is unrestricted in Canada. Nitrosamines are also on the Hotlist. However, the Hotlist restriction does not necessarily address so-called unintentional ingredients – e.g., residual levels of DEA and nitrosamine formation in products containing DEA-related ingredients.

International regulations are stronger. The European Union Cosmetics Directive restricts the concentration and use of cocamide and lauramide DEA in cosmetics, and limits the maximum nitrosamine concentration in products containing these ingredients.<sup>27</sup>

### Related Ingredients

**MEA** (monoethanolamide) and **TEA** (triethanolamine) are related chemicals. Like DEA, they can react with other chemicals in cosmetics to form carcinogenic nitrosamines.

# Dibutyl phthalate

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## Use in Cosmetics

Dibutyl phthalate (pronounced *thal-ate*), or DBP, is used mainly in nail products as a solvent for dyes and as a plasticizer that prevents nail polishes from becoming brittle.

## Health and Environmental Hazards

DBP is absorbed through the skin.<sup>28</sup> It can enhance the capacity of other chemicals to cause genetic mutations, although it has not been shown to be a mutagen itself.<sup>29</sup> In laboratory experiments, it has been shown to cause developmental defects, changes in the testes and prostate and reduced sperm counts.<sup>30</sup> The European Union classifies DBP as a suspected endocrine disruptor on the basis of evidence that it interferes with hormone function,<sup>31</sup> and as toxic to reproduction on the basis that it may cause harm to the unborn child and impair fertility.<sup>32</sup> As well, Health Canada notes evidence suggesting that exposure to phthalates may cause health effects such as liver and kidney failure in young children when products containing phthalates are sucked or chewed for extended periods.<sup>33</sup>

The European Union classifies DBP as very toxic to aquatic organisms.<sup>34</sup> Under the Convention for the Protection of the Marine Environment of the North-East Atlantic, DBP is listed as a Chemical for Priority Action.<sup>35</sup>

## Regulatory Status

Health Canada recently announced regulations banning six phthalates (including DBP) in soft vinyl children's toys and child care articles, but its use in cosmetics is not restricted.

International regulations are stronger. The European Union bans DBP in cosmetics, as well as in childcare articles and toys.

## Related Ingredients

Other phthalates are widely used as fragrance ingredients in cosmetics – in particular diethyl phthalate (DEP). DEP is suspected of interfering with hormone function (endocrine disruption), causing reproductive and developmental problems among other health effects.<sup>36</sup> Fragrance recipes are considered trade secrets, so manufacturers are not required to disclose specific fragrance chemicals. The best bet to avoid phthalates in cosmetics is to opt for products that do not list “parfum” or “fragrance” (see below) as an ingredient.

## *Formaldehyde-releasing preservatives: DMDM hydantoin, diazolidinyl urea, imidazolidinyl urea, methenamine, quaternium-15 and sodium hydroxymethylglycinate*<sup>37</sup>

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### **Use in Cosmetics**

These ingredients slowly and continuously release small amounts of formaldehyde, which functions as a preservative.<sup>38</sup> Formaldehyde-releasers are used in a wide range of cosmetics. Other industrial applications of formaldehyde include production of resins used in wood products, vinyl flooring and other plastics, permanent-press fabric and toilet bowl cleaners. While formaldehyde occurs naturally in the environment at low levels, worldwide industrial production tops 21 million tons per year.<sup>39</sup>

### **Health and Environmental Hazards**

The [International Agency for Research on Cancer](#) classifies formaldehyde as a known human carcinogen.<sup>40</sup> Most of the cancer research on formaldehyde has focused on risks from inhalation. Small amounts of formaldehyde may off-gas from cosmetics. Off-gassing of formaldehyde from building products is already a concern for indoor air quality and Health Canada recommends the reduction or elimination of as many sources of formaldehyde as possible.<sup>41</sup>

Some formaldehyde releasers can also irritate skin and eyes and trigger allergies at low doses.<sup>42</sup> Health Canada and Environment Canada categorized methenamine and quaternium-15 as “moderate human health priorities” and possibly persistent in the environment. They have been flagged for future assessment under the government’s [Chemicals Management Plan](#).

### **Regulatory Status**

Formaldehyde is a restricted ingredient in cosmetics in Canada. It cannot be added in concentrations greater than 0.2 per cent in most products.<sup>43</sup> However, there is no restriction on the low-levels of formaldehyde released by DMDM hydantoin, diazolidinyl urea, imidazolidinyl urea, methenamine, quaternium-15 and sodium hydroxymethylglycinate, nor on the use of these ingredients themselves.

International regulations are stronger. In the European Union formaldehyde-releasing preservatives in cosmetics must be identified on the product label with the notice, “contains formaldehyde” if the concentration of formaldehyde in the product exceeds 0.05 per cent.<sup>44</sup>

### **Related Ingredients**

**Formaldehyde** is an ingredient in some nail hardeners. Health Canada allows concentrations up to 5 per cent in these products. **Tosylamide/formaldehyde resin**, used in nail polishes, may contain residual formaldehyde concentrations up to 0.5 per cent.<sup>45</sup>

# Paraben, methylparaben, butylparaben and propylparaben

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## Use in Cosmetics

Parabens are the most widely used preservative in cosmetics. An estimated 75 to 90 per cent of cosmetics contain parabens (typically at very low levels).<sup>46</sup>

## Health and Environmental Hazards

Parabens easily penetrate the skin<sup>47</sup> and are suspected of interfering with hormone function (endocrine disruption).<sup>48</sup> Parabens can mimic estrogen, the primary female sex hormone. In one study, parabens were detected in human breast cancer tissues, raising questions about a possible association between parabens in cosmetics and cancer.<sup>49</sup> Parabens may also interfere with male reproductive functions.<sup>50</sup> In addition, studies indicate that methylparaben applied on the skin reacts with [UVB](#) leading to increased skin aging and DNA damage.<sup>51</sup>

Parabens occur naturally at low levels in certain foods, such as barley, strawberries, currents, vanilla, carrots and onions, although a synthetic preparation derived from petrochemicals is used in cosmetics. Parabens in foods are metabolized when eaten, making them less strongly estrogenic.<sup>52</sup> In contrast, when applied to the skin and absorbed into the body, parabens in cosmetics bypass the metabolic process and enter the blood stream and body organs intact. It has been estimated that women are exposed to 50 mg per day of parabens from cosmetics.<sup>53</sup> More research is needed concerning the resulting levels of parabens in people. Studies conducted by the U.S. Centers for Disease Control and Prevention (CDC) did find four different parabens in human urine samples, indicating exposure despite the very low levels in products.<sup>54</sup>

## Regulatory Status

There are no restrictions on the use of parabens in cosmetics in Canada.

International regulations are stronger. The European Union restricts the concentration of parabens in cosmetics.

## Related Ingredients

Methylparaben, butylparaben and propylparaben are some of the most common parabens in cosmetics. Other chemicals in this class generally have “paraben” in their names (e.g., isobutylparaben, ethylparaben, etc.).

## Parfum (Fragrance)

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### Use in Cosmetics

The term *parfum* (or *fragrance*) on a cosmetic ingredients list usually represents a complex mixture of dozens of chemicals. Some 3,000 chemicals are used as fragrances.<sup>55</sup> Fragrance is an obvious ingredient in perfumes, colognes and deodorants, but it's used in nearly every type of personal care product. Even products marketed as "fragrance-free" or "unscented" may in fact contain fragrance ingredients, in the form of masking agents<sup>56</sup> that prevent the brain from perceiving odour. In addition to their use in cosmetics, fragrances are found in numerous other consumer products, notably laundry detergents and softeners and cleaning products.

### Health and Environmental Hazards

Many of unlisted fragrance ingredients are irritants and can trigger allergies,<sup>57</sup> migraines<sup>58</sup> and asthma symptoms.<sup>59</sup> A survey of asthmatics found that perfume and/or colognes triggered attacks in nearly three out of four individuals.<sup>60</sup> There is also evidence suggesting that exposure to perfume can exacerbate asthma and perhaps even contribute to its development in children.<sup>61</sup> U.K. researchers have reported that "perfume" is the second most common cause of allergy in patients at dermatology clinics.<sup>62</sup> People with multiple chemical sensitivities (MCS) or environment-related illnesses are particularly vulnerable, with fragrances implicated both in development of the condition and triggering symptoms.<sup>63</sup>

In addition, in laboratory experiments, individual fragrance ingredients have been associated with cancer<sup>64</sup> and neurotoxicity<sup>65</sup> among other adverse health effects.

Synthetic musks used in fragrances are of particular concern from an ecological perspective. Environment Canada has categorized several synthetic musks as persistent, bioaccumulative and/or toxic, and others as human health priorities. Measureable levels of synthetic musks are found in fish in the Great Lakes and the levels in sediment are increasing.<sup>66</sup> Laboratory tests of human umbilical cord blood commissioned by the U.S. Environmental Working Group detected common synthetic musks (Galaxolide and/or Tonalide) in seven out of 10 newborns sampled.<sup>67</sup>

Some fragrance ingredients are not perfuming agents themselves but enhance the performance of perfuming agents. For example, diethyl phthalate (pronounced *tha-late*), or DEP, is widely used in cosmetic fragrances to make the scent linger. The [European Commission on Endocrine Disruption](#) has listed DEP as a Category 1 priority substance, based on evidence that it interferes with hormone function.<sup>68</sup> Phthalates have been linked to reduced sperm count in men and reproductive defects in the developing male fetus (when the mother is exposed during pregnancy), among other health effects.<sup>69</sup> Phthalate metabolites are also associated with obesity and insulin resistance in men.<sup>70</sup> As well, Health Canada notes evidence suggesting that exposure to phthalates may cause liver and kidney failure in young children when products containing phthalates are sucked or chewed for extended periods.<sup>71</sup> DEP is listed as a Priority and Toxic Pollutant under the U.S. *Clean Water Act*, based on evidence that it can be toxic to wildlife and the environment.<sup>72</sup>

Laboratory analysis of top-selling colognes and perfumes identified an average of 14 chemicals per product not listed on the label, including multiple chemicals that can trigger allergic reactions or interfere with hormone function.<sup>73</sup>



### **Regulatory Status**

Fragrance recipes are considered trade secrets so manufacturers are not required to disclose fragrance chemicals in the list of ingredients. Environment Canada is currently assessing one synthetic musk (moskene) under the government's Chemicals Management Plan and has flagged several others for future assessment. Health Canada recently announced regulations banning six phthalates in children's toys (including DEP), but the use of DEP in cosmetics is unrestricted.

International regulations are stronger. The European Union restricts the use of many fragrance ingredients, including two common musks (nitromusks) and requires warning labels on products if they contain any of 26 allergens commonly used as cosmetic fragrances.<sup>74</sup>

## PEGs

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### Use in Cosmetics

PEGs (polyethylene glycols) are petroleum-based compounds that are widely used in cream bases for cosmetics as thickeners, solvents, softeners and moisture-carriers.

### Health and Environmental Hazards

Depending on manufacturing processes, PEGs may be contaminated with measurable amounts of 1,4-dioxane.<sup>75</sup> The [International Agency for Research on Cancer](#) classifies 1,4-dioxane as a possible human carcinogen,<sup>76</sup> and it is also persistent.<sup>77</sup> In other words, it doesn't easily degrade and can remain in the environment long after it is rinsed down the shower drain. 1,4-dioxane can be removed from cosmetics during the manufacturing process by vacuum stripping, but there is no easy way for consumers to know whether products containing PEGs have undergone this process.<sup>78</sup> In a study of personal care products marketed as "natural" or "organic" (uncertified), U.S. researchers found 1,4-dioxane as a contaminant in 46 of 100 products analyzed.<sup>79</sup>

While carcinogenic contaminants are the primary concern, PEGs themselves show some evidence of genotoxicity<sup>80</sup> and if used on broken skin can cause irritation and systemic toxicity.<sup>81</sup> The industry panel that reviews the safety of cosmetics ingredients concluded that some PEGs are not safe for use on damaged skin (although the assessment generally approved of the use of these chemicals in cosmetics).<sup>82</sup> Also, PEGs function as "penetration enhancers," increasing the permeability of the skin to allow greater absorption of the product - including potentially harmful ingredients.<sup>83</sup>

### Regulatory Status

There are no restrictions on the use of PEGs in cosmetics in Canada. 1,4-dioxane is prohibited on Health Canada's Cosmetic Ingredient Hotlist. However, the Hotlist restriction does not necessarily address so-called unintentional ingredients – e.g., 1,4-dioxane as a contaminant in ethoxylates. 1,4-dioxane was recently assessed under the government's [Chemicals Management Plan](#), but Health Canada and Environment Canada concluded that the chemical did not meet the legal definition of "toxic" because estimated exposure levels were considered to be lower than those that might constitute a danger to human health. The assessment noted uncertainty in the exposure estimates, "due to the limited information on the presence or concentrations of the substance in consumer products available in Canada."<sup>84</sup>

### Related Ingredients

**Propylene glycol** is a related chemical that, like PEGs, functions as a penetration enhancer and can allow harmful ingredients to be absorbed more readily through the skin. It can also cause allergic reactions. Health Canada categorized propylene glycol as a "moderate human health priority" and flagged it for future assessment under the government's Chemicals Management Plan.

Other **ethoxylates** may be contaminated with 1,4-dioxane. These ingredients usually have chemical names including the letters "eth" (e.g., polyethylene glycol).

# Petrolatum

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## Use in Cosmetics

Also known as mineral oil jelly, petrolatum is used as a barrier to lock moisture in the skin in a variety of moisturizers. It is also used in hair care products to make hair shine.

## Health and Environmental Hazards

A petroleum product, petrolatum can be contaminated with polycyclic aromatic hydrocarbons (PAHs). Studies suggest that exposure to PAHs – including skin contact over extended periods of time – is associated with cancer.<sup>85</sup> On this basis, the European Union classifies petrolatum a carcinogen<sup>86</sup> and restricts its use in cosmetics. PAHs in petrolatum can also cause skin irritation and allergies.<sup>87</sup>

## Regulatory Status

In the European Union, petrolatum can only be used in cosmetics “if the full refining history is known and it can be shown that the substance from which it is produced is not a carcinogen.”<sup>88</sup> There is no parallel restriction in Canada. Petrolatum is being assessed under the government’s [Chemicals Management Plan](#).

## Related Ingredients

**Mineral oil** and **petroleum distillates** are related petroleum by-products used in cosmetics. Like petrolatum, these ingredients may be contaminated with PAHs.

## ***Siloxanes: cyclotetrasiloxane, cyclopentasiloxane, cyclohexasiloxane and cyclomethicone***

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### **Use in Cosmetics**

These silicone-based compounds are used in cosmetics to soften, smooth and moisten. They make hair products dry more quickly and deodorant creams slide on more easily. They are also used extensively in moisturizers and facial treatments.

### **Health and Environmental Hazards**

Environment Canada assessments concluded that cyclotetrasiloxane and cyclopentasiloxane – also known as D4 and D5 – are toxic, persistent and have the potential to bioaccumulate in aquatic organisms.<sup>89,90</sup> Also, the European Union classifies D4 as an endocrine disruptor, based on evidence that it interferes with human hormone function,<sup>91</sup> and a possible reproductive toxicant that may impair human fertility.<sup>92</sup> In laboratory experiments, exposure to high doses of D5 has been shown to cause uterine tumours and harm to the reproductive and immune systems. D5 can also influence neurotransmitters in the nervous system.<sup>93</sup>

Structurally similar to D4 and D5, cyclohexasiloxane (or D6) is also persistent and has the potential to bioaccumulate. Environment Canada's assessment of D6 concluded that this third siloxane is not entering the environment in a quantity or concentration that endangers human health or the environment, but noted significant data gaps concerning its toxicity.<sup>94</sup>

Cyclomethicone is a mixture of D4, D5 and D6 siloxanes.

### **Regulatory Status**

January 2009, Environment Canada and Health Canada proposed to add D4 and D5 siloxanes to the List of Toxic Substances pursuant to the *Canadian Environmental Protection Act, 1999* (CEPA) and to develop regulations "to limit the quantity or concentration of D4 and D5 in certain personal care products."<sup>95</sup> In addition, under CEPA, anyone proposing a "significant new activity" involving siloxanes must notify the Minister of the Environment. However, there are currently no restrictions on these ingredients in cosmetics.

### **Related Ingredients**

Polydimethylsiloxane (PDMS) silicone polymers are produced from D4 and contain residual amounts of D4 and D5. Dimethicone is a common PDMS ingredient in cosmetics. Other siloxanes have chemical names ending in "*-siloxane*" or "*-cone*."

## Sodium laureth sulfate

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### Use in Cosmetics

Sodium laureth sulfate (sometimes referred to as SLES) is used in cosmetics as a cleansing agent and also to make products bubble and foam. It is common in shampoos, shower gels and facial cleansers. It is also found in household cleaning products, like dish soap.

### Health and Environmental Hazards

Sodium laureth sulfate is another "ethoxylated" ingredient. Like PEGs, it may be contaminated with measurable amounts of 1,4-dioxane, depending on manufacturing processes.<sup>96</sup> The [International Agency for Research on Cancer](#) classifies 1,4-dioxane as a possible human carcinogen,<sup>97</sup> and it is also persistent.<sup>98</sup> In other words, it doesn't easily degrade and can remain in the environment long after it is rinsed down the shower drain. 1,4-dioxane can be removed from cosmetics during the manufacturing process by vacuum stripping, but there is no easy way for consumers to know whether products containing sodium laureth sulfate have undergone this process.<sup>99</sup> In a study of personal care products marketed as "natural" or "organic" (uncertified), U.S. researchers found 1,4-dioxane as a contaminant in 46 of 100 products analyzed.<sup>100</sup>

The industry panel that reviews the safety of cosmetics ingredients notes that sodium laureth sulfate can irritate the skin and eyes (though approving of its use in cosmetics).<sup>101</sup>

### Regulatory Status

There are no restrictions on the use of sodium laureth sulfate in cosmetics in Canada. 1,4-dioxane is prohibited on Health Canada's Cosmetic Ingredient Hotlist. However, the Hotlist restriction does not necessarily address so-called unintentional ingredients – e.g., 1,4-dioxane as a contaminant in ethoxylates. 1,4-dioxane was recently assessed under the government's [Chemicals Management Plan](#) but Health Canada and Environment Canada concluded that the chemical did not meet the legal definition of "toxic" because estimated exposure levels were considered to be lower than those that might constitute a danger to human health. The assessment noted uncertainty in the exposure estimates "due to the limited information on the presence or concentrations of the substance in consumer products available in Canada."<sup>102</sup>

Health Canada has categorized sodium laureth sulfate as a "moderate human health priority" and flagged it for future assessment under the government's [Chemicals Management Plan](#).

### Related Ingredients

**Sodium lauryl sulfate** (SLS), a related cleansing agent, is a skin, eye and respiratory tract irritant and toxic to aquatic organisms.<sup>103</sup>

Other **ethoxylates** may be contaminated with 1,4-dioxane. These ingredients usually have chemical names including the letters "*eth*" (e.g., sodium laureth sulfate).

# Triclosan

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## Use in Cosmetics

Triclosan is used mainly in antiperspirants, cleansers and hand sanitizers as a preservative and an anti-bacterial agent. This chemical can be found in a wide range of household products, including garage bags, toys, linens, mattresses, toilet fixtures, clothing, furniture fabric, paints, laundry detergent and facial tissues, as well as cosmetics.

## Health and Environmental Hazards

Triclosan can pass through skin<sup>104</sup> and is suspected of interfering with hormone function (endocrine disruption).<sup>105</sup> U.S. Centers for Disease Control and Prevention scientists detected triclosan in the urine of nearly 75 per cent of those tested (2,517 people ages six years and older).<sup>106</sup> The European Union classifies triclosan as irritating to the skin and eyes, and as very toxic to aquatic organisms, noting that it may cause long-term adverse effects in the aquatic environment.<sup>107</sup> Environment Canada has categorized it as inherently toxic to aquatic organisms and persistent.<sup>108</sup> In other words, it doesn't easily degrade and can build up in the environment after it has been rinsed down the shower drain. In the environment, triclosan can also react to form dioxins, which bioaccumulate and are toxic.<sup>109</sup>

The extensive use of triclosan in consumer products may contribute to antibiotic-resistant bacteria. The Canadian Medical Association has called for a ban on antibacterial consumer products, such as those containing triclosan.<sup>110</sup>

## Regulatory Status

Health Canada's Cosmetic Ingredient Hotlist limits the concentration of triclosan to 0.03 per cent in mouthwashes and 0.3 per cent in other cosmetics. The problem is that triclosan is used in so many products that the small amounts found in each product add up – particularly since the chemical does not readily degrade. Moreover, some anti-bacterial hand sanitizers containing triclosan may not classify as "cosmetics" as per the *Food and Drug Act*. Products classified as "drugs" on the basis of a therapeutic claim or function are not subject to the *Cosmetic Regulations* or the Hotlist restriction.

Environment Canada has flagged triclosan for future assessment under the government's [Chemicals Management Plan](#).

## Notes

- <sup>1</sup> U.S. National Library of Medicine, in *Haz-Map: Occupational Exposure to Hazardous Agents*, 2010, <http://hazmap.nlm.nih.gov>.
- <sup>2</sup> IARC *Monographs on the Evaluation of Carcinogenic Risks to Humans* vol. 17 (Paris: International Agency for Research on Cancer), vol. 40 (1986).
- <sup>3</sup> *Study on Enhancing the Endocrine Disrupter Priority List with a Focus on Low Production Volume Chemicals*, Revised Report to DG Environment (Hersholm, Denmark: DHI Water and Environment, 2007), [http://ec.europa.eu/environment/endocrine/documents/final\\_report\\_2007.pdf](http://ec.europa.eu/environment/endocrine/documents/final_report_2007.pdf).
- <sup>4</sup> UNEP and OECD, *2,6-di-tert-butyl-p-cresol (BHT) Screening Information Data Set: Initial Assessment Report* (Paris: OECD, 2002), <http://www.inchem.org/documents/sids/sids/128370.pdf>.
- <sup>5</sup> Baur, A.K. et al., "The lung tumor promoter, butylated hydroxytoluene (BHT), causes chronic inflammation in promotion-sensitive BALB/cByJ mice but not in promotion-resistant C57BL/6 mice," *Toxicology* 169, no. 1 (December 2001): 1-15.
- <sup>6</sup> Wada, H. et al., "In vitro estrogenicity of resin composites," *Journal of Dental Research* 83, no. 3 (March 2004): 222-6.
- <sup>7</sup> Schrader, TJ and GM Cooke, "Examination of selected food additives and organochlorine food contaminants for androgenic activity in vitro," *Toxicological Sciences* 53, no. 2 (February 2000): 278-88.
- <sup>8</sup> "OSPAR List of Substances of Possible Concern. Fact sheet for Butylhydroxyanisol." (OSPAR, April 15, 2002), <http://www.ospar.org>.
- <sup>9</sup> UNEP and OECD, *2,6-di-tert-butyl-p-cresol (BHT) Screening Information Data Set: Initial Assessment Report*.
- <sup>10</sup> Winter, Ruth, *A Consumer's Dictionary of Cosmetic Ingredients*, 7th ed. (New York: Three Rivers Press, 2009), 166.
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