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# **Safety Assessment of Alkyl PEG-PPG Ethers as Used in Cosmetics**

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*All interested persons are provided 60 days from the above release date to comment on this safety assessment and to identify additional published data that should be included or provide unpublished data which can be made public and included. Information may be submitted without identifying the source or the trade name of the cosmetic product containing the ingredient. All unpublished data submitted to CIR will be discussed in open meetings, will be available at the CIR office for review by any interested party and may be cited in a peer-reviewed scientific journal. Please submit data, comments, or requests to the CIR Director, Dr. F. Alan Andersen.*

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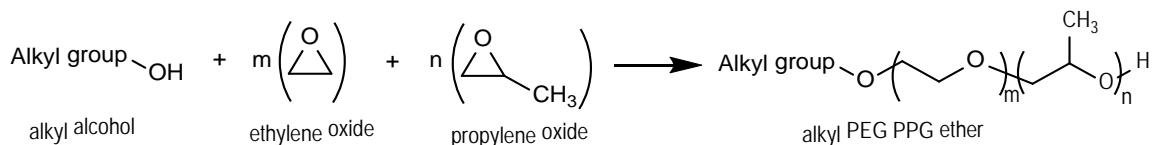
## INTRODUCTION

This Scientific Literature Review is the first step in reviewing the safety of 131 alkyl PEG-PPG ethers (listed in Table 1) as used in cosmetics. Most of the alkyl PEG-PPG ethers included in this review are reported to function in cosmetics as surfactants, skin conditioning agents, and/or emulsifying agents.<sup>1</sup> Limited physical and chemical properties data, and no published information on the amount of residual monomer in the ethers, absorption, distribution, metabolism and excretion data, toxicology data, or dermal irritation and sensitization data, were found. The Cosmetic Ingredient Review (CIR) is asking that these types of data, if available, be submitted to the CIR for use in this safety assessment.

## CHEMISTRY

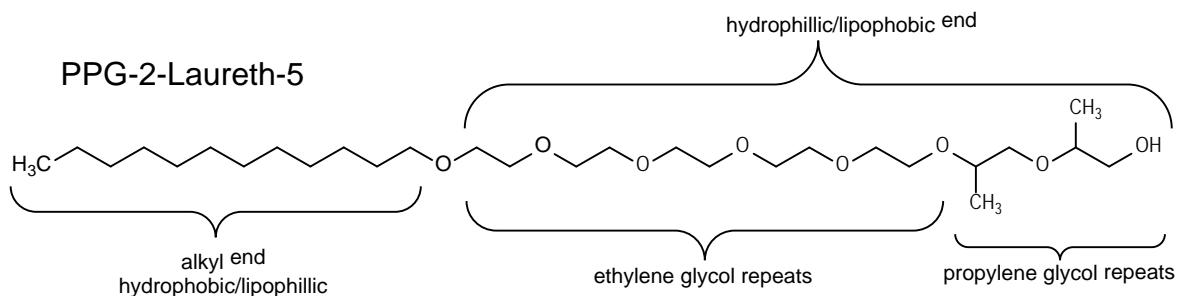
### **Definition and Structure**

An alkyl PEG-PPG ether is the reaction product of an alkyl alcohol and one or more equivalents each of ethylene oxide and propylene oxide (forming repeats of polyethylene glycol (PEG) and polypropylene glycol (PPG), respectively). (Figure 1). The definition of each ingredient, as given in the *International Cosmetic Ingredient Dictionary and Handbook*, is provided in Table 2.<sup>1</sup>



**Figure 1. Alkyl PEG-PPG Ether synthesis**

PPG-2-Laureth-5 represents one of the simplest ingredients in this review, as the reaction product of lauryl alcohol, five equivalents of ethylene oxide, and two equivalents of propylene oxide:



**Figure 2. Alkyl PEG-PPG Ether structure – example: PPG-2-Laureth-5**

Each of the alkyl PEG-PPG ethers is a surfactant-like molecule, with a chain structure that has a hydrophobic end and a hydrophilic end. Principally, these ingredients differ by variation of the alkyl chain length, at the hydrophobic end, and the number of alkoxide (PEG and PPG) repeat units, at the poly-alkoxide, hydrophilic end. The structures in this report are drawn as block-type, alkoxide polymers only for simplicity sake. The actual order of alkoxide repeats in each ingredient, and from each source of an ingredient, may be block, alternating, or random.

There are a number of nomenclature conventions to be aware of in this group. For example, PEG-4-PPG-7 C13/C15 alcohol is an ingredient wherein the alkyl chain is variably thirteen or fifteen carbons long (“C13/C15 alcohol”) and the poly-alkoxide end is comprised of an average of four ethylene glycol repeats and seven propylene glycol repeats (“PEG-4-PPG-7”). PPG-2-laureth-5 is an ingredient (as shown in Figure 2) wherein the alkyl chain is derived from lauryl alcohol (i.e., is twelve carbons long; “laur”) and the poly-alkoxide end is comprised of an average of five ethylene glycol repeats (“eth-5”) and two propylene glycol repeats (“PPG-2”). And, PEG/PPG-40/2 propylheptyl ether is an ingredient wherein the hydrophobic end is a seven carbon alkyl chain (“heptyl”), with a three carbon branch at the 2-position (“propyl”; this naming convention indicates a Guerbet alcohol and thus substitution at the 2-position), and the poly-alkoxide end is comprised of an average of forty ethylene glycol repeats and two propylene glycol repeats (“PEG/PPG-40/2”).

The dimethyl ethers are distinct in this group by being capped at both ends with methyl groups, instead of having one alkyl chain, at one end. For example, PEG/PPG-3/6 dimethyl ether is an ingredient wherein one carbon is at each end of a poly-oxide chain, comprised of an average of three ethylene glycol repeats and six propylene glycol repeats.

## **Physical and Chemical Properties**

Physical and chemical properties data on the alkyl PEG-PPG esters are provided in Table 3.<sup>2-23</sup> Very little published data on specific properties were available, other than most of the alkyl PEG-PPG ethers are clear to slightly yellow liquids.

The alkyl PEG-PPG ethers, as alkoxyate polymers, are generally not defined as a single compound, but as a mixture of a homologous series with a medium-range molecular weight and a specific percentage by weight of the hydrophobic block.<sup>24</sup> The degree of hydrophobicity and hydrophilicity are controlled by the components that make up each ether. The hydrophobicity of the product can be controlled by the fatty alcohol used and the length of the propylene glycol block; alternatively, the hydrophilicity is controlled by varying the length and position of the ethylene glycol block.

## **Method of Manufacture**

The manufacture of alkyl PEG-PPG ethers consists of a number of variable steps.<sup>25</sup> The first step typically involves activating the alkyl alcohol (e.g., lauryl alcohol) with a metal hydroxide (e.g., potassium hydroxide), generating a chain alkoxide (e.g., lauroxide; i.e. the initiator). This chain alkoxide is then reacted with ethoxide, propoxide, or a mixture of both (a mixture for random poly-alkoxides and consecutively for block poly-alkoxides; i.e. propagation). The propagation of the poly-alkoxide is then terminated with a Brønsted-Lowry type acid (e.g., hydrochloric acid), or in the case of the dimethyl ethers, a methyl halide (e.g. methyl iodide). This synthetic pathway (specifically, the addition of ethoxide) can potentially lead to the generation of some 1,4-dioxane. However, this byproduct can be easily monitored by gas chromatography.

Inclusion of propylene oxide into nonionic surfactants can be accomplished by 1) placement of a single block of propylene oxide between the alcohol and a block of ethylene oxide; 2) by placing a single block of propylene oxide after a single block of ethylene oxide; 3) by direct placement into the polyoxyethylene portion as a propylene oxide block or as an ethylene oxide-propylene oxide mix; or 4) by placing a single propylene oxide block in the middle of the ethylene oxide chain.<sup>26</sup> The propylene oxide placement affects the physical and surface active properties.

## **Impurities**

No published impurities data were found, other than PPG-25-laureth-25 contains ≤10 mg/l 1,4-dioxane.<sup>27</sup>

It is not expected that there would be any significant amount of the residual starting materials used in the manufacture of the alkyl PEG-PPG ethers remaining in these ingredients. However, information on the amount of residual starting material in the alkyl PEG-PPG ethers is desired because of the carcinogenic potential of the two starter materials, i.e., ethylene oxide and propylene oxide.

The National Toxicology Program (NTP) *Report on Carcinogens, Twelfth Edition* concluded that ethylene oxide is known to be a human carcinogen based on sufficient evidence of carcinogenicity from studies in humans, including epidemiological studies and studies on mechanisms of carcinogenesis.<sup>28</sup> The International Agency for Research on Cancer (IARC) concluded there is limited evidence in humans and sufficient evidence in experimental animals for the carcinogenicity of ethylene oxide, with an overall evaluation that ethylene oxide is carcinogenic to humans.<sup>29</sup>

The NTP *Report on Carcinogens, Twelfth Edition* concluded that propylene oxide is reasonably anticipated to be a human carcinogen based on sufficient evidence of carcinogenicity from studies in experimental animals.<sup>30</sup> The IARC concluded there is inadequate evidence in humans and there is sufficient evidence in experimental animals for the carcinogenicity of propylene oxide, with an overall evaluation that propylene oxide is possibly carcinogenic to humans.<sup>29</sup>

## **USE**

### **Cosmetic**

The alkyl PEG-PPG ethers included in this review are reported to function in cosmetics mostly as surfactants, skin conditioning agents, and/or emulsifying agents.<sup>1</sup> The function(s) of each ingredient are provided in Table 2.

The FDA collects information from manufacturers on the use of individual ingredients in cosmetic formulations as a function of cosmetic product category in its Voluntary Cosmetic Registration Program (VCRP). VCRP data obtained from the FDA in 2012 indicate that 19 of the 131 alkyl PEG-PPG ethers named in this safety assessment are currently used in cosmetic formulations; additionally, PPG-30-decytetradeceth-10, an ingredient not named in the *International Cosmetic Ingredient Dictionary and Handbook*, also has a use, according to VCRP data.<sup>31</sup> PPG-5-ceteth-20 has the most reported uses, 414, followed by PPG-1-trideceth-6, 221 reported uses, and PEG/PPG-36/41 dimethyl ether, 189 reported uses. All other in-use ingredients have less than 40 reported uses. (Table 4). A concentration of use survey is being conducted by the Personal Care Products Council; the results of that survey will be included when available. Alkyl PEG-PPG ethers not reported to be in use, according to VCRP data, are listed in Table 5.

Some alkyl PEG-PPG ethers are reported to be used on baby skin, to be applied to the eye area or mucous membranes, or could possibly be ingested. Additionally, some of the alkyl esters are used in cosmetic sprays and could possibly be inhaled. In practice, 95% to 99% of the droplets/particles released from cosmetic sprays have aerodynamic equivalent diameters >10

$\mu\text{m}$ , with propellant sprays yielding a greater fraction of droplets/particles  $<10 \mu\text{m}$  compared with pump sprays.<sup>32,33</sup> Therefore, most droplets/particles incidentally inhaled from cosmetic sprays would be deposited in the nasopharyngeal and thoracic regions of the respiratory tract and would not be respirable (i.e., they would not enter the lungs) to any appreciable amount.<sup>34,35</sup> There is some evidence indicating that deodorant spray products can release substantially larger fractions of particulates having aerodynamic equivalent diameters in the range considered to be respirable.<sup>35</sup> However, the information is not sufficient to determine whether significantly greater lung exposures result from the use of deodorant sprays, compared to other cosmetic sprays.

All of the alkyl PEG-PPG ethers included in this report are listed in the European Union inventory of cosmetic ingredients.<sup>36</sup>

#### **Non-Cosmetic**

In Europe, PPG-4-trideceth-6 can be used at 0.05 mg/kg food; it is to be used only in polytetrafluoroethylene (PTFE) items sintered at high temperatures.<sup>37</sup> (PTFE is the non-stick coating used on cookware).<sup>38</sup>

The inclusion of PPG-5-ceteth-20 in the development of dermal<sup>39</sup> and nasal<sup>40</sup> drug delivery systems is being evaluated.<sup>39</sup> In both studies, systems composed of PPG-5-ceteth-20, oleic acid, and water were used to form thermodynamically-stable microemulsions that could phase into a liquid crystalline matrix.

Other examples of non-cosmetic industrial uses are provided in Table 6.<sup>2,9,22</sup>

#### **TOXICOKINETICS**

Published absorption, distribution, metabolism, and excretion data were not found.

#### **Penetration Enhancement**

PPG-4-ceteth-20 did not enhance, and actually decreased, the penetration of tenoxicam, a non-steroidal anti-inflammatory drug, through guinea pig skin.<sup>41</sup> An in vitro study was performed in which the permeation through guinea pig skin of a 1.0% tenoxicam suspension containing 10% propylene glycol and 5.0% PPG-4-ceteth-20 was compared to that of tenoxicam without the surfactant. One g of the test material was applied to the skin sample, and the receptor fluid was sampled every 3 h, for 48 h. The steady-state flux was  $8.11 \pm 0.56 \times 10^{-5} \mu\text{g/s} \cdot \text{cm}^2$  for tenoxicam without surfactant and  $7.28 \pm 0.94 \times 10^{-5} \mu\text{g/s} \cdot \text{cm}^2$  for tenoxicam with PPG-4-ceteth-20; penetration was slowed in a non-statistically significant manner.

#### **TOXICOLOGICAL STUDIES**

Published single and repeated dose toxicity and ocular irritation studies were not found.

#### **REPRODUCTIVE AND DEVELOPMENTAL TOXICITY**

Published reproductive and developmental toxicity studies were not found.

#### **GENOTOXICITY**

Published genotoxicity studies were not found.

#### **CARCINOGENICITY**

Published carcinogenicity studies were not found.

#### **IRRITATION AND SENSITIZATION**

Published dermal irritation and sensitization studies were not found.

#### **INFORMATION SOUGHT**

The CIR is anticipating that the Expert Panel will need the following types of data to assess the safety of the alkyl PEG-PPG ethers as used in cosmetics. Upon review of the document, the Panel may decide that certain types of data may not be needed for their assessment, or, additional types of data may be requested.

1. physical and chemical properties data;
2. information on the amount of residual monomer remaining in the ethers;
3. information on the presence of 1,4-dioxane;
4. toxicokinetics data;
5. repeated-dose toxicity data;
6. reproductive/developmental toxicity data;\*
7. genotoxicity data; if positive, carcinogenicity data may be needed; and,
8. irritation and sensitization data.

\*While these data may not be crucial if these ingredients have no appreciable dermal penetration, if available, they would improve the resulting safety assessment.

## **SUMMARY**

This report is a safety assessment of 131 alkyl PEG-PPG ethers as used in cosmetics. An alkyl PEG-PPG ether is the reaction product of an alkyl alcohol and one or more equivalents each of ethylene oxide and propylene oxide (forming repeats of PEG and PPG, respectively). Each of the alkyl PEG-PPG ethers is a surfactant-like molecule, with a chain structure that has a hydrophobic end and a hydrophilic end; the dimethyl ethers are distinct in this group by being capped at both ends with methyl groups, instead of having one alkyl chain, at one end. The alkyl PEG-PPG ethers are typically manufactured by: 1) activating the alcohol; 2) generating a chain alkoxide; 3) reacting the chain alkoxide with ethoxide, propoxide, or a mixture of both; and 4) terminating the propagation. The actual order of alkoxide repeats in each ingredient, and from each source of an ingredient, may be block, alternating, or random, and the propylene oxide placement affects the physical and surface active properties.

The alkyl PEG-PPG ethers are reported to function in cosmetics mostly as surfactants, skin conditioning agents, and/or emulsifying agents. VCRP data obtained from the FDA in 2012 indicate that 19 of the alkyl PEG-PPG ethers named in this safety assessment are currently used in cosmetic formulations. PPG-5-ceteth-20 has the most reported uses, 414, followed by PPG-1-trideceth-6, 221 reported uses, and PEG/PPG-36/41 dimethyl ether, 189 reported uses; all other in-use ingredients have less than 40 reported uses.

In Europe, PPG-4-trideceth-6 can be used at 0.05 mg/kg food; it is to be used only in PTFE items sintered at high temperatures. PPG-5-ceth-20 is being evaluated for inclusion in dermal and nasal drug delivery systems.

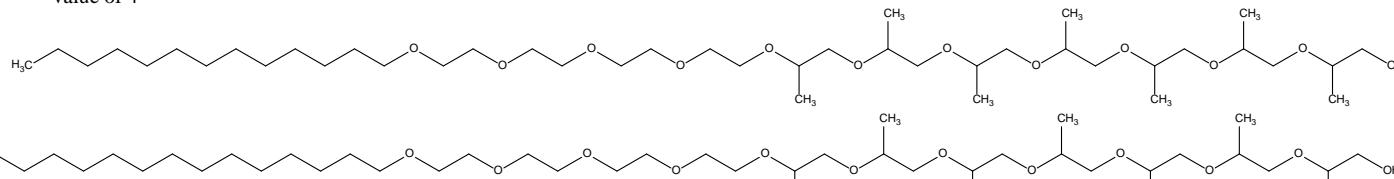
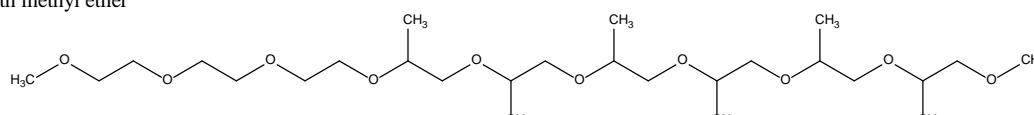
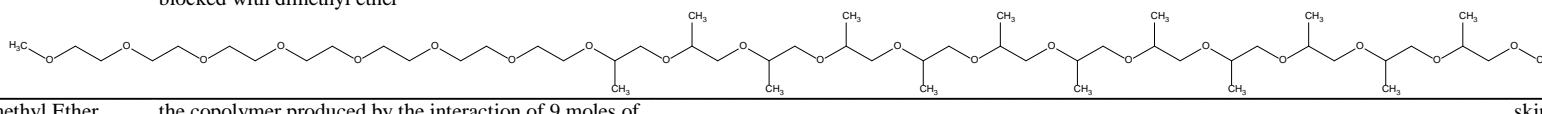
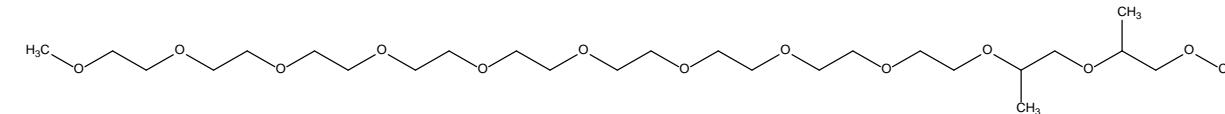
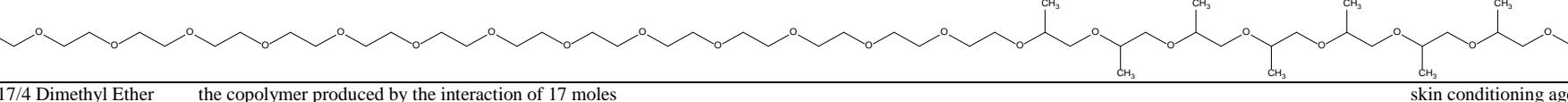
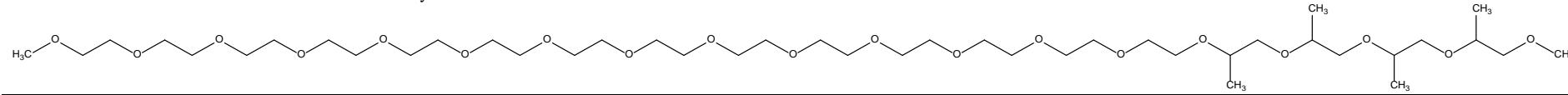
Often, surfactants can be penetration enhancers. However, PPG-4-ceteth-20 did not enhance, and actually decreased, the penetration of tenoxicam through guinea pig skin.

## TABLES

**Table 1. Alkyl PEG-PPG Ethers included in this assessment**

PEG-4-PPG-7 C13/C15 Alcohol	PPG-2 C9-11 Pareth-11	PPG-2-Isodeceth-4
PEG/PPG-3/6 Dimethyl Ether	PPG-2 C12-13 Pareth-8	PPG-2-Isodeceth-6
PEG/PPG-7/12 Dimethyl Ether	PPG-2 C12-15 Pareth-6	PPG-2-Isodeceth-8
PEG/PPG-9/2 Dimethyl Ether	PPG-4 C13-15 Pareth-15	PPG-2-Isodeceth-9
PEG/PPG-14/7 Dimethyl Ether	PPG-5 C9-15 Pareth-6	PPG-2-Isodeceth-10
PEG/PPG-17/4 Dimethyl Ether	PPG-6 C9-11 Pareth-5	PPG-2-Isodeceth-12
PEG/PPG-22/40 Dimethyl Ether	PPG-6 C12-15 Pareth-12	PPG-2-Isodeceth-18
PEG/PPG-27/14 Dimethyl Ether	PPG-6 C12-18 Pareth-11	PPG-2-Isodeceth-25
PEG/PPG-35/40 Dimethyl Ether	PPG-3 C12-14 Sec-Pareth-7	PPG-3-Isodeceth-1
PEG/PPG-36/41 Dimethyl Ether	PPG-4 C12-14 Sec-Pareth-5	PPG-4-Isodeceth-10
PEG/PPG-50/40 Dimethyl Ether	PPG-5 C12-14 Sec-Pareth-7	PPG-3-Isosteareth-9
PEG/PPG-52/32 Dimethyl Ether	PPG-5 C12-14 Sec-Pareth-9	PPG-2-Laureth-5
PEG/PPG-55/28 Dimethyl Ether	PPG-1-Deceth-4	PPG-2-Laureth-8
PEG/PPG-4/2 Propylheptyl Ether	PPG-1-Deceth-5	PPG-2-Laureth-12
PEG/PPG-6/2 Propylheptyl Ether	PPG-1-Deceth-6	PPG-3-Laureth-8
PEG-7/PPG-2 Propylheptyl Ether	PPG-1-Deceth-7	PPG-3-Laureth-9
PEG/PPG-8/2 Propylheptyl Ether	PPG-2-Deceth-3	PPG-3-Laureth-10
PEG/PPG-10/2 Propylheptyl Ether	PPG-2-Deceth-5	PPG-3-Laureth-12
PEG/PPG-14/2 Propylheptyl Ether	PPG-2-Deceth-7	PPG-4 Laureth-2
PEG/PPG-40/2 Propylheptyl Ether	PPG-2-Deceth-8	PPG-4 Laureth-5
PPG-2-Ceteareth-9	PPG-2-Deceth-10	PPG-4 Laureth-7
PPG-4-Ceteareth-12	PPG-2-Deceth-12	PPG-4-Laureth-15
PPG-10-Ceteareth-20	PPG-2-Deceth-15	PPG-5-Laureth-5
PPG-1-Ceteth-1	PPG-2-Deceth-20	PPG-6-Laureth-3
PPG-1-Ceteth-5	PPG-2-Deceth-30	PPG-25-Laureth-25
PPG-1-Ceteth-10	PPG-2-Deceth-40	PPG-3-Myreth-3
PPG-1-Ceteth-20	PPG-2-Deceth-50	PPG-3-Myreth-11
PPG-2-Ceteth-1	PPG-2-Deceth-60	PPG-2-PEG-11 Hydrogenated Lauryl Alcohol Ether
PPG-2-Ceteth-5	PPG-4-Deceth-4	PPG-3-PEG-6 Oleyl Ether
PPG-2-Ceteth-10	PPG-4-Deceth-6	PPG-9-Steareth-3
PPG-2-Ceteth-20	PPG-6-Deceth-4	PPG-23-Steareth-34
PPG-4-Ceteth-1	PPG-6-Deceth-9	PPG-30 Steareth-4
PPG-4-Ceteth-5	PPG-8-Deceth-6	PPG-34-Steareth-3
PPG-4-Ceteth-10	PPG-14-Deceth-6	PPG-38 Steareth-6
PPG-4-Ceteth-20	PPG-6-Decyltetradeceth-12	PPG-1 Trideceth- 6
PPG-5-Ceteth-20	PPG-6-Decyltetradeceth-20	PPG-1 Trideceth-13
PPG-8-Ceteth-1	PPG-6-Decyltetradeceth-30	PPG-4 Trideceth-6
PPG-8-Ceteth-2	PPG-13-Decyltetradeceth-24	PPG-6 Trideceth-8
PPG-8-Ceteth-5	PPG-20-Decyltetradeceth-10	Propylene Glycol Capreth-4
PPG-8-Ceteth-10	PPG-9-Ethylhexeth-5	Propylene Glycol Isodeceth-4
PPG-8-Ceteth-20	PPG-1-Isodeceth-4	Propylene Glycol Isodeceth-12
PPG-2 C9-11 Pareth-5	PPG-1-Isodeceth-6	Propylene Glycol Laureth-6
PPG-2 C9-11 Pareth-7	PPG-1-Isodeceth-7	Propylene Glycol Oleth-5
PPG-2 C9-11 Pareth-8	PPG-1-Isodeceth-9	

**Table 2. Definitions, Structures, and Functions**

Ingredient (CAS No. if available)	Definition <sup>1</sup>	Structure <sup>1 ;CIR staff*</sup>	Function
PEG-4-PPG-7 C13/C15 Alcohol	the polyoxypropylene, polyoxyethylene ether of a mixture of synthetic C13/C15 alcohols with an average propoxylation value of 7 and an average ethoxylation value of 4		surfactant – emulsifying agent
PEG/PPG-3/6 Dimethyl Ether (61419-46-3)	the copolymer produced by the interaction of 3 moles of ethylene oxide with 6 moles of propylene oxide end-blocked with methyl ether		skin conditioning agent - misc
PEG/PPG-7/12 Dimethyl Ether	copolymer produced by the interaction of 7 moles of ethylene oxide with 12 moles of propylene oxide end-blocked with dimethyl ether		skin conditioning agent - misc
PEG/PPG-9/2 Dimethyl Ether (61419-46-3)	the copolymer produced by the interaction of 9 moles of ethylene oxide with 2 moles of propylene oxide end-blocked with dimethyl ether		skin conditioning agent - misc
PEG/PPG-14/7 Dimethyl Ether (61419-46-3)	the copolymer produced by the interaction of 14 moles of ethylene oxide with 7 moles of propylene oxide end-blocked with dimethyl ether		skin conditioning agent - misc
PEG/PPG-17/4 Dimethyl Ether	the copolymer produced by the interaction of 17 moles of ethylene oxide with 4 moles of propylene oxide end-blocked with dimethyl ether		skin conditioning agent - misc

**Table 2. Definitions, Structures, and Functions**

Ingredient (CAS No. if available)	Definition <sup>1</sup>	Structure <sup>1, CIR staff*</sup>	Function
PEG/PPG-22/40 Dimethyl Ether	a copolymer produced by the interaction of 22 moles of ethylene oxide with 40 moles of propylene oxide end-blocked with methyl ether		skin conditioning agent - misc
PEG/PPG-27/14 Dimethyl Ether	a copolymer produced by the interaction of 27 moles of ethylene oxide with 14 moles of propylene oxide end-blocked with methyl ether		skin conditioning agent - misc
PEG/PPG-35/40 Dimethyl Ether	the copolymer produced by interacting 35 moles of ethylene oxide with 40 moles of propylene oxide end-blocked with dimethyl ether		skin conditioning agent - misc
PEG/PPG-36/41 Dimethyl Ether	the copolymer produced by the interaction of 36 moles of ethylene oxide and 41 moles of propylene oxide end-blocked with methyl ether		skin conditioning agent - misc
PEG/PPG-50/40 Dimethyl Ether	the copolymer produced by the interaction of 50 moles of ethylene oxide with 40 moles of propylene oxide end-blocked with dimethyl ether		skin conditioning agent - misc
PEG/PPG-52/32 Dimethyl Ether	a copolymer produced by the interaction of 52 moles of ethylene oxide with 32 moles of propylene oxide end-blocked with methyl ether		skin conditioning agent - misc
PEG/PPG-55/28 Dimethyl Ether	a copolymer produced by the interaction of 55 moles of ethylene oxide with 28 moles of propylene oxide end-blocked with methyl ether		skin conditioning agent - misc
PEG/PPG-4/2 Propylheptyl Ether (166736-08-9)	the product formed by the reaction of 2-propylheptanol with an average of 4 moles of ethylene oxide and 2 moles of propylene oxide		surfactant – cleansing, dispersing, emulsifying, or solubilizing agent
PEG/PPG-6/2 Propylheptyl Ether (166736-08-9)	the product formed by the reaction of 2-propylheptanol with an average of 6 moles of ethylene oxide and 2 moles of propylene oxide		surfactant – cleansing, dispersing, emulsifying, or solubilizing agent

**Table 2. Definitions, Structures, and Functions**

Ingredient (CAS No. if available)	Definition <sup>1</sup>	Structure <sup>1, CIR staff*</sup>	Function
PEG-7/PPG-2 Propylheptyl Ether (166736-08-9)	the product formed by the reaction of 2-propylheptanol with an average of 7 moles of ethylene oxide and 2 moles of propylene oxide		surfactant – cleansing, dispersing, emulsifying, or solubilizing agent
PEG/PPG-8/2 Propylheptyl Ether (166736-08-9)	the product formed by the reaction of 2-propylheptanol with an average of 8 moles of ethylene oxide and 2 moles of propylene oxide		surfactant – cleansing, dispersing, emulsifying, or solubilizing agent
PEG/PPG-10/2 Propylheptyl Ether (166736-08-9)	the product formed by the reaction of 2-propylheptanol with an average of 10 moles of ethylene oxide and 2 moles of propylene oxide		surfactant – cleansing, dispersing, emulsifying, or solubilizing agent
PEG/PPG-14/2 Propylheptyl Ether (166736-08-9)	the product formed by the reaction of 2-propylheptanol with an average of 14 moles of ethylene oxide and 2 moles of propylene oxide		surfactant – cleansing, dispersing, emulsifying, or solubilizing agent
PEG/PPG-40/2 Propylheptyl Ether (166736-08-9)	the product formed by the reaction of 2-propylheptanol with an average of 40 moles of ethylene oxide and 2 moles of propylene oxide		surfactant – cleansing, dispersing, emulsifying, or solubilizing agent
PPG-2-Ceteareth-9	the polyoxypropylene, polyoxyethylene ether of Cetearyl Alcohol (q.v.) that conforms generally to the formula where R represents a blend of cetyl and stearyl radicals, x has an average value of 2 and y has an average value of 9		surfactant – emulsifying agent
PPG-4-Ceteareth-12	the polyoxypropylene, polyoxyethylene ether of Cetearyl Alcohol (q.v.) that conforms generally to the formula where R represents a blend of cetyl and stearyl radicals, x has an average value of 4 and y has an average value of 12		surfactant – emulsifying agent
PPG-10-Ceteareth-20	the polyoxypropylene, polyoxyethylene ether of Cetearyl Alcohol (q.v.) that conforms generally to the formula: (structure) where R represents a blend of cetyl and stearyl radicals, x has an average value of 10 and y has an average value of 20		surfactant – emulsifying agent

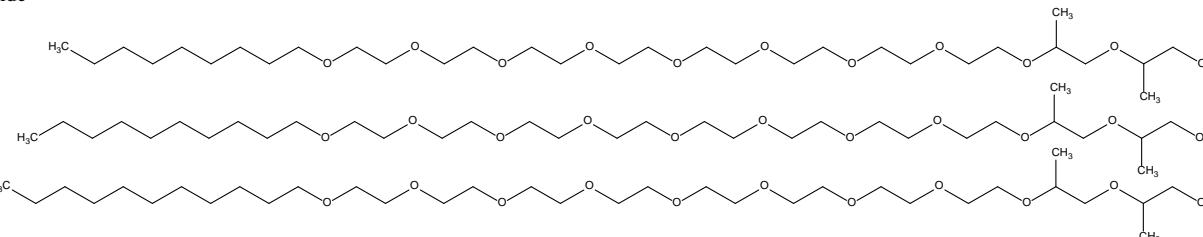
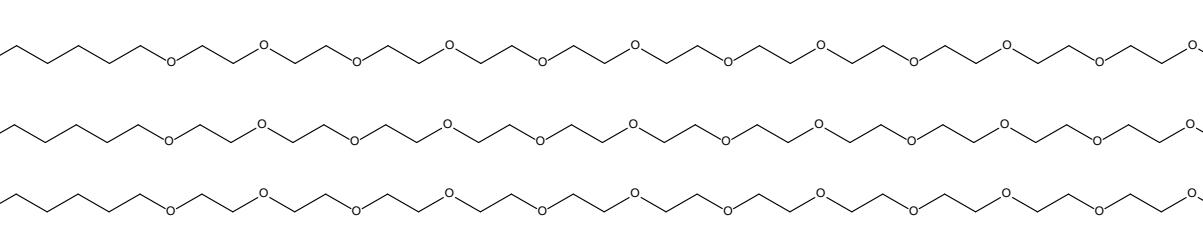
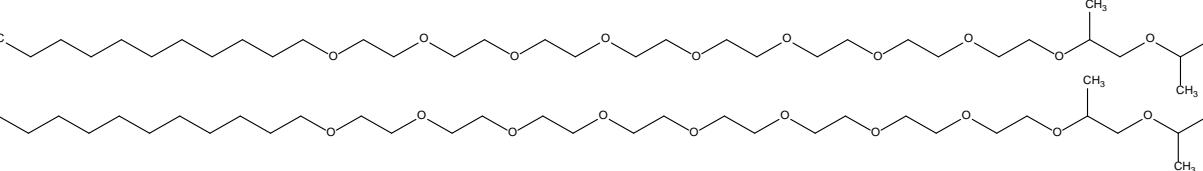
**Table 2. Definitions, Structures, and Functions**

<b>Ingredient (CAS No. if available)</b>	<b>Definition<sup>1</sup></b>	<b>Structure<sup>1,2;CIR staff*</sup></b>	<b>Function</b>
PPG-1-Ceteth-1 (37311-01-6; 9087-53-0)	the polyoxypropylene, polyoxyethylene ether of cetyl alcohol that conforms generally to the formula where x has an average value of 1 and y has an average value of 1	$\text{CH}_3(\text{CH}_2)_{15}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	skin conditioning agent – emollient; surfactant – emulsifying agent
PPG-1-Ceteth-5 (37311-01-6; 9087-53-0)	the polyoxypropylene, polyoxyethylene ether of cetyl alcohol that conforms generally to the formula where x has an average value of 1 and y has an average value of 5	$\text{CH}_3(\text{CH}_2)_{15}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	skin conditioning agent – emollient; surfactant – emulsifying agent
PPG-1-Ceteth-10 (37311-01-6; 9087-53-0)	the polyoxypropylene, polyoxyethylene ether of cetyl alcohol that conforms generally to the formula where x has an average value of 1 and y has an average value of 10	$\text{CH}_3(\text{CH}_2)_{15}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	skin conditioning agent – emollient; surfactant – emulsifying agent
PPG-1-Ceteth-20 (37311-01-6; 9087-53-0)	the polyoxypropylene, polyoxyethylene ether of cetyl alcohol that conforms generally to the formula: (structure) where x has an average value of 1 and y has an average value of 20	$\text{CH}_3(\text{CH}_2)_{15}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	skin conditioning agent – emollient; surfactant – emulsifying and solubilizing agent
PPG-2-Ceteth-1 (37311-01-6; 9087-53-0)	the polyoxypropylene, polyoxyethylene ether of cetyl alcohol that conforms generally to the formula: (structure) where x has an average value of 2 and y has an average value 1	$\text{CH}_3(\text{CH}_2)_{15}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	skin conditioning agent – emollient; surfactant – emulsifying agent
PPG-2-Ceteth-5 (37311-01-6; 9087-53-0)	the polyoxypropylene, polyoxyethylene ether of cetyl alcohol that conforms generally to the formula where x has an average value of 2 and y has an average value of 5	$\text{CH}_3(\text{CH}_2)_{15}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	skin conditioning agent – emollient; surfactant – emulsifying agent
PPG-2-Ceteth-10 (37311-01-6; 9087-53-0)	the polyoxypropylene, polyoxyethylene ether of cetyl alcohol that conforms generally to the formula where x has an average value of 2 and y has an average value of 10	$\text{CH}_3(\text{CH}_2)_{15}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	skin conditioning agent – emollient; surfactant – emulsifying agent
PPG-2-Ceteth-20 (37311-01-6; 9087-53-0)	is the polyoxypropylene, polyoxyethylene ether of cetyl alcohol that conforms generally to the formula where x has an average value of 2 and y has an average value of 20	$\text{CH}_3(\text{CH}_2)_{15}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	skin conditioning agent – emollient; surfactant – emulsifying and solubilizing agent
PPG-4-Ceteth-1 (37311-01-6; 9087-53-0)	the polyoxypropylene polyoxyethylene ether of cetyl alcohol that conforms generally to the formula where x has an average value of 4 and y has an average value of 1	$\text{CH}_3(\text{CH}_2)_{15}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	skin conditioning agent – emollient; surfactant – emulsifying agent
PPG-4-Ceteth-5 (37311-01-6; 9087-53-0)	the polyoxypropylene, polyoxyethylene ether of cetyl alcohol that conforms generally to the formula where x has an average value of 4 and y has an average value of 5	$\text{CH}_3(\text{CH}_2)_{15}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	skin conditioning agent – emollient; surfactant – emulsifying agent
PPG-4-Ceteth-10 (37311-01-6; 9087-53-0)	the polyoxypropylene, polyoxyethylene ether of cetyl alcohol that conforms generally to the formula where x has an average value of 4 and y has an average value of 10	$\text{CH}_3(\text{CH}_2)_{15}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	surfactant – emulsifying agent
PPG-4-Ceteth-20 (37311-01-6; 9087-53-0)	the polyoxypropylene, polyoxyethylene ether of cetyl alcohol that conforms generally to the formula where x has an average value of 4 and y has an average value of 20	$\text{CH}_3(\text{CH}_2)_{15}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	surfactant – emulsifying agent

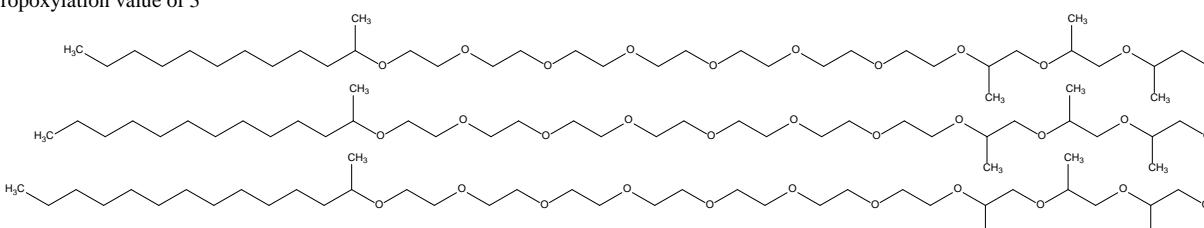
**Table 2. Definitions, Structures, and Functions**

Ingredient (CAS No. if available)	Definition <sup>1</sup>	Structure <sup>1 ;CIR staff*</sup>	Function
PPG-5-Ceteth-20 (37311-01-6; 9087-53-0)	the polyoxypropylene, polyoxyethylene ether of cetyl alcohol that conforms generally to the formula where x has an average value of 5 and y has an average value of 20	$\text{CH}_3(\text{CH}_2)_{15}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$ 	surfactant – emulsifying agent
PPG-8-Ceteth-1 (37311-01-6; 9087-53-0)	the polyoxypropylene, polyoxyethylene ether of cetyl alcohol that conforms generally to the formula where x has an average value of 8 and y has an average value of 1	$\text{CH}_3(\text{CH}_2)_{15}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$ 	skin conditioning agent – emollient; surfactant – emulsifying agent
PPG-8-Ceteth-2 (37311-01-6; 9087-53-0)	the polyoxypropylene, polyoxyethylene ether of cetyl alcohol that conforms generally to the formula where x has an average value of 8 and y has an average value of 2	$\text{CH}_3(\text{CH}_2)_{15}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$ 	skin conditioning agent – emollient; surfactant – emulsifying agent
PPG-8-Ceteth-5 (37311-01-6; 9087-53-0)	the polyoxypropylene, polyoxyethylene ether of cetyl alcohol that conforms generally to the formula where x has an average value of 8 and y has an average value of 5	$\text{CH}_3(\text{CH}_2)_{15}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$ 	skin conditioning agent – emollient; surfactant – emulsifying agent
PPG-8-Ceteth-10 (37311-01-6; 9087-53-0)	the polyoxypropylene, polyoxyethylene ether of cetyl alcohol that conforms generally to the formula where x has an average value of 8 and y has an average value of 10	$\text{CH}_3(\text{CH}_2)_{15}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$ 	skin conditioning agent – emollient; surfactant – emulsifying agent
PPG-8-Ceteth-20 (37311-01-6; 9087-53-0)	the polyoxypropylene, polyoxyethylene ether of cetyl alcohol that conforms generally to the formula where x has an average value of 8 and y has an average value of 20	$\text{CH}_3(\text{CH}_2)_{15}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$ 	surfactant – emulsifying agent
PPG-2 C9-11 Pareth-5	the polypropylene glycol ether of a mixture of synthetic C9-11 ethoxylated fatty alcohols containing an average of 5 moles of ethylene oxide and 2 moles of propylene oxide		surfactant – emulsifying agent
PPG-2 C9-11 Pareth-7	the polypropylene glycol ether of a mixture of synthetic C9-11 ethoxylated fatty alcohols containing an average of 7 moles of ethylene oxide and 2 moles of propylene oxide		surfactant – emulsifying agent

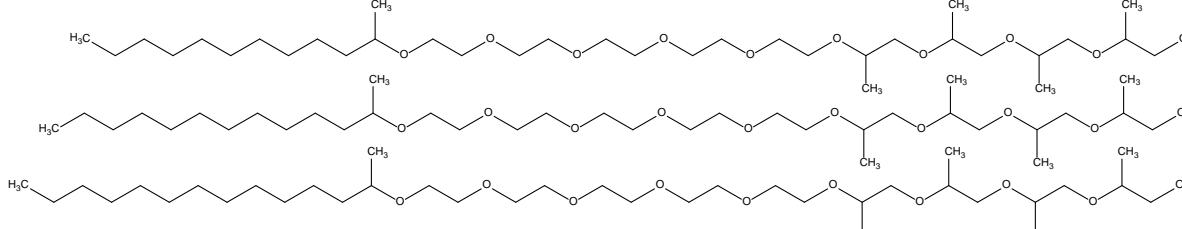
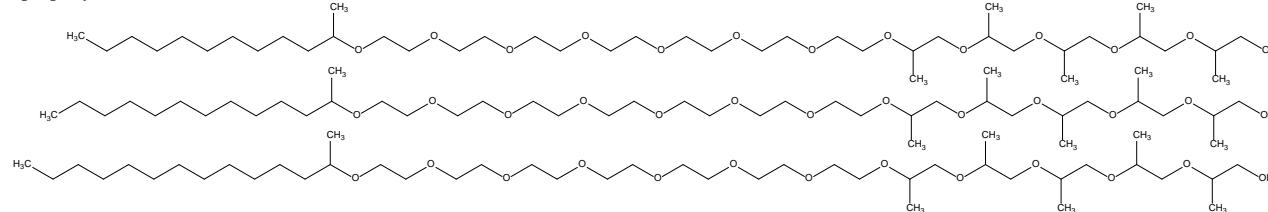
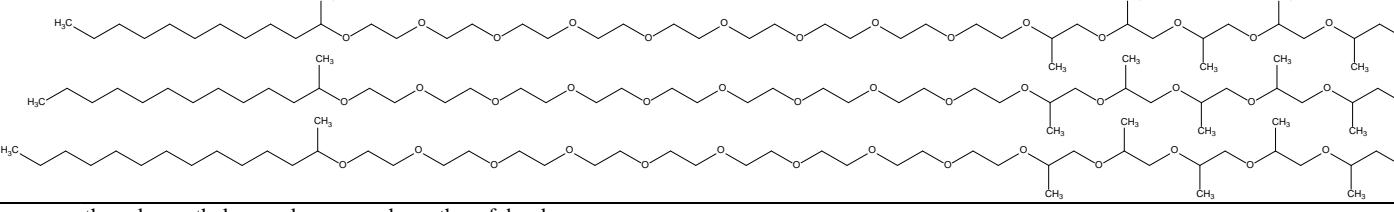
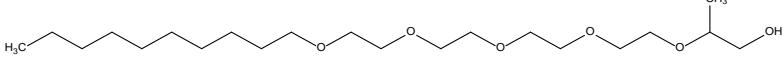
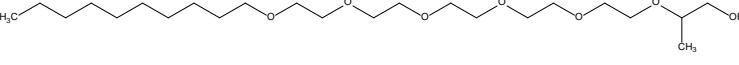
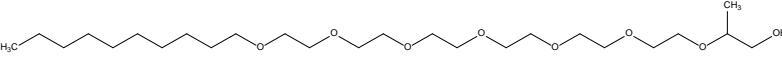
**Table 2. Definitions, Structures, and Functions**

Ingredient (CAS No. if available)	Definition <sup>1</sup>	Structure <sup>1 ;CIR staff*</sup>	Function
PPG-2 C9-11 Pareth-8	the polypropylene glycol ether of a mixture of synthetic C9-11 ethoxylated fatty alcohols containing an average of 8 moles of ethylene oxide and 2 moles of propylene oxide		surfactant – emulsifying and cleansing agent
PPG-2 C9-11 Pareth-11	the polypropylene glycol ether of a mixture of synthetic C9-11 ethoxylated fatty alcohols containing an average of 11 moles of ethylene oxide and 2 moles of propylene oxide		surfactant – emulsifying and cleansing agent
PPG-2 C12-13 Pareth-8	the polypropylene glycol ether of a mixture of synthetic C12-13 ethoxylated fatty alcohols containing an average of 8 moles of ethylene oxide and 2 moles of propylene oxide		surfactant – emulsifying agent
PPG-2 C12-15 Pareth-6	a polyoxyethylene, polyoxypropylene ether of a mixture of synthetic alcohols that conforms generally to the formula where R represents a C12-15 alcohol, x has an average value of 2 and y has an average value of 6	$\begin{array}{c} \text{R(OCHCH}_2\text{)}_x(\text{OCH}_2\text{CH}_2\text{)}_y\text{OH} \\   \\ \text{CH}_3 \end{array}$	surfactant – emulsifying agent
PPG-4 C13-15 Pareth-15	the polyoxyethylene, polyoxypropylene ether of a mixture of synthetic alcohols that conforms generally to the formula: (structure) where R represents an alcohol stem with 13-15 carbons in the alkyl chain, x has an average value of 4, and y has an average value of 15	$\begin{array}{c} \text{R(OCHCH}_2\text{)}_x(\text{OCH}_2\text{CH}_2\text{)}_y\text{OH} \\   \\ \text{CH}_3 \end{array}$	surfactant – emulsifying agent

**Table 2. Definitions, Structures, and Functions**

<b>Ingredient (CAS No. if available)</b>	<b>Definition<sup>1</sup></b>	<b>Structure<sup>1 ;CIR staff*</sup></b>	<b>Function</b>
PPG-5 C9-15 Pareth-6	the polyoxyethylene, polyoxypropylene ether of a mixture of synthetic alcohols that conforms generally to the formula where R represents a fatty alcohol group with 9 to 15 carbons in the alkyl chain, x has an average value of 5 and y has an average value of 6	$\begin{array}{c} \text{R(OCHCH}_2\text{x(OCH}_2\text{CH}_2\text{)}_y\text{OH} \\   \\ \text{CH}_3 \end{array}$	surfactant – emulsifying agent
PPG-6 C9-11 Pareth-5 (154518-36-2)	the polyoxypropylene, polyoxyethylene ether of a mixture of synthetic alcohols that conforms generally to the formula where R represents the C9-11 fatty alcohol group, x has an average value of 6 and y has an average value of 5	$\begin{array}{c} \text{R(OCHCH}_2\text{x(OCH}_2\text{CH}_2\text{)}_y\text{OH} \\   \\ \text{CH}_3 \end{array}$	surfactant – emulsifying agent
PPG-6 C12-15 Pareth-12 (68551-13-3) <sup>36</sup>	the polyoxyethylene, polyoxypropylene ether of a mixture of synthetic alcohols that conforms generally to the formula where R represents an alkyl stem with 12-15 carbons, x has an average value of 6 and y has an average value of 12	$\begin{array}{c} \text{R(OCHCH}_2\text{x(OCH}_2\text{CH}_2\text{)}_y\text{OH} \\   \\ \text{CH}_3 \end{array}$	surfactant – emulsifying agent
PPG-6 C12-18 Pareth-11	the polyoxyethylene, polyoxypropylene ether of a mixture of synthetic alcohols that conforms generally to the formula where R represents an alcohol stem with 12 to 18 carbons in the alkyl chain, x has an average value of 6 and y has an average value of 11	$\begin{array}{c} \text{R(OCHCH}_2\text{x(OCH}_2\text{CH}_2\text{)}_y\text{OH} \\   \\ \text{CH}_3 \end{array}$	surfactant – emulsifying agent
PPG-3 C12-14 Sec-Pareth-7 (68131-40-8) <sup>9</sup>	the polyoxyethylene, polyoxypropylene ether of a mixture of synthetic secondary C12-14 alcohols with an average ethoxylation value of 7 and an average propoxylation value of 3		emulsion stabilizer; surfactant – emulsifying agent

**Table 2. Definitions, Structures, and Functions**

Ingredient (CAS No. if available)	Definition <sup>1</sup>	Structure <sup>1 ;CIR staff*</sup>	Function
PPG-4 C12-14 Sec-Pareth-5 (68131-40-8) <sup>9</sup>	the polyoxyethylene, polyoxypropylene ether of a mixture of synthetic secondary C12-14 alcohols with an average ethoxylation value of 5 and an average propoxylated value of 4		emulsion stabilizer; surfactant – emulsifying agent
PPG-5 C12-14 Sec-Pareth-7 (68131-40-8) <sup>9</sup>	the polyoxyethylene, polyoxypropylene ether of a mixture of synthetic secondary C12-14 alcohols with an average ethoxylation value of 7 and an average propoxylated value of 5		emulsion stabilizer; surfactant – emulsifying agent
PPG-5 C12-14 Sec-Pareth-9 (68131-40-8) <sup>9</sup>	the polyoxyethylene, polyoxypropylene ether of a mixture of synthetic secondary C12-14 alcohols with an average ethoxylation value of 9 and an average propoxylated value of 5		emulsion stabilizer; surfactant – emulsifying agent
PPG-1-Deceth-4	the polyoxyethylene, polyoxypropylene ether of decyl alcohol that conforms generally to the formula: (structure) where x has an average value of 1 and y has an average value of 4		surfactant- cleansing and emulsifying agent
PPG-1-Deceth-5	the polyoxyethylene, polyoxypropylene ether of decyl alcohol that conforms generally to the formula: (structure) where x has an average value of 1 and y has an average value of 5		surfactant- cleansing and emulsifying agent
PPG-1-Deceth-6	the polyoxyethylene, polyoxypropylene ether of decyl alcohol that conforms generally to the formula: (structure) where x has an average value of 1 and y has an average value of 6		surfactant – emulsifying agent

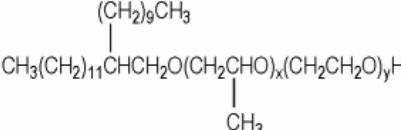
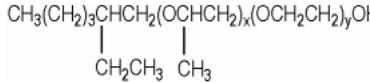
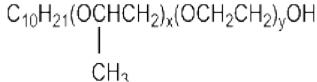
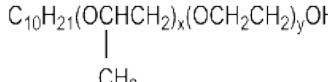
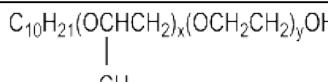
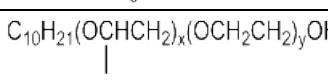
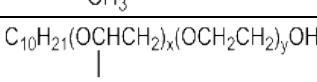
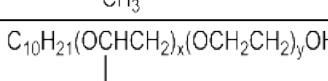
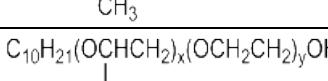
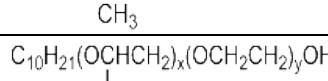
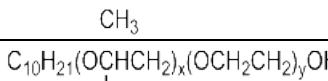
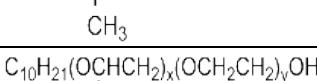
**Table 2. Definitions, Structures, and Functions**

Ingredient (CAS No. if available)	Definition <sup>1</sup>	Structure <sup>1, CIR staff*</sup>	Function
PPG-1-Deceth-7	the polyoxyethylene, polyoxypropylene ether of decyl alcohol that conforms generally to the formula: (structure) where x has an average value of 1 and y has an average value of 7		surfactant- cleansing and emulsifying agent
PPG-2-Deceth-3 (37251-67-5)	the polyoxypropylene, polyoxyethylene ether of decyl alcohol that conforms generally to the formula where x has an average value of 2 and y has an average value of 3	$\text{CH}_3(\text{CH}_2)_8\text{CH}_2(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	surfactant – emulsifying agent
PPG-2-Deceth-5	the polyoxyethylene, polyoxypropylene ether of decyl alcohol that conforms generally to the formula where x has an average value 2 and y has an average value of 5	$\text{CH}_3(\text{CH}_2)_9(\text{OCH}_2\text{CH}_2)_y(\text{OCHCH}_2)_x\text{OH}$   CH <sub>3</sub>	surfactant – emulsifying agent
PPG-2-Deceth-7 (37251-67-5)	the polyoxypropylene, polyoxyethylene ether of decyl alcohol that conforms generally to the formula: (structure) where x has an average value of 2 and y has an average value of 7	$\text{CH}_3(\text{CH}_2)_8\text{CH}_2(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	surfactant – emulsifying agent
PPG-2-Deceth-8	the polyoxypropylene, polyoxyethylene ether of decyl alcohol that conforms generally to the formula where x has an average value of 2 and y has an average value of 8	$\text{CH}_3(\text{CH}_2)_8\text{CH}_2(\text{OCH}_2\text{CH}_2)_x(\text{OCHCH}_2)_y\text{OH}$   CH <sub>3</sub>	surfactant – emulsifying agent
PPG-2-Deceth-10 (37251-67-5)	the polyoxypropylene, polyoxyethylene ether of decyl alcohol that conforms generally to the formula where x has an average value of 2 and y has an average value of 10	$\text{CH}_3(\text{CH}_2)_9(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	surfactant – emulsifying agent
PPG-2-Deceth-12 (37251-67-5)	the polyoxypropylene, polyoxyethylene ether of decyl alcohol that conforms generally to the formula where x has an average value of 2 and y has an average value of 12	$\text{CH}_3(\text{CH}_2)_8\text{CH}_2(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	surfactant – emulsifying agent
PPG-2-Deceth-15 (37251-67-5)	the polyoxypropylene, polyoxyethylene ether of decyl alcohol that conforms generally to the formula where x has an average value of 2 and y has an average value of 15	$\text{CH}_3(\text{CH}_2)_8\text{CH}_2(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	surfactant – emulsifying agent
PPG-2-Deceth-20 (37251-67-5)	the polyoxypropylene, polyoxyethylene ether of decyl alcohol that conforms generally to the formula where x has an average value of 2 and y has an average value of 20	$\text{CH}_3(\text{CH}_2)_8\text{CH}_2(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	surfactant – emulsifying agent
PPG-2-Deceth-30 (37251-67-5)	the polyoxyethylene, polyoxypropylene ether of decyl alcohol that conforms generally to the formula where x has an average value of 2 and y has an average value of 30	$\text{CH}_3(\text{CH}_2)_8\text{CH}_2(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	surfactant – emulsifying agent
PPG-2-Deceth-40	the polyoxyethylene, polyoxypropylene ether of decyl alcohol that conforms generally to the formula where x has an average value of 2 and y has an average value of 40	$\text{CH}_3(\text{CH}_2)_8\text{CH}_2(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	surfactant – emulsifying agent
PPG-2-Deceth-50	the polyoxyethylene, polyoxypropylene ether of decyl alcohol that conforms generally to the formula where x has an average value of 2 and y has an average value of 50	$\text{CH}_3(\text{CH}_2)_8\text{CH}_2(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	surfactant – emulsifying agent

**Table 2. Definitions, Structures, and Functions**

Ingredient (CAS No. if available)	Definition <sup>1</sup>	Structure <sup>1,2;CIR staff*</sup>	Function
PPG-2-Deceth-60	the polyoxyethylene, polyoxypropylene ether of decyl alcohol that conforms generally to the formula where x has an average value of 2 and y has an average value of 60	$\text{CH}_3(\text{CH}_2)_8\text{CH}_2(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	surfactant – emulsifying agent
PPG-4-Deceth-4	the polyoxypropylene, polyoxyethylene ether of decyl alcohol that conforms generally to the formula where x has an average value of 4 and y has an average value of 4	$\text{CH}_3(\text{CH}_2)_9(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	surfactant – emulsifying agent
PPG-4-Deceth-6 (37251-67-5)	the polyoxypropylene, polyoxyethylene ether of decyl alcohol that conforms generally to the formula where x has an average value of 4 and y has an average value of 6	$\text{CH}_3(\text{CH}_2)_9(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	surfactant – emulsifying agent
PPG-6-Deceth-4 (68154-97-2) <sup>36</sup>	the polyoxypropylene, polyoxyethylene ether of decyl alcohol that conforms generally to the formula where x has an average value of 6 and y has an average value of 4	$\text{CH}_3(\text{CH}_2)_9(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	surfactant – emulsifying agent
PPG-6-Deceth-9 (68154-97-2) <sup>36</sup>	the polyoxypropylene, polyoxyethylene ether of decyl alcohol that conforms generally to the formula where x has an average value of 6 and y has an average value of 9	$\text{CH}_3(\text{CH}_2)_9(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	surfactant – emulsifying agent
PPG-8-Deceth-6 (68154-97-2) <sup>36</sup>	the polyoxypropylene, polyoxyethylene ether of decyl alcohol that conforms generally to the formula where x has an average value of 8 and y has an average value of 6	$\text{CH}_3(\text{CH}_2)_9(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	surfactant – emulsifying agent
PPG-14-Deceth-6	the polyoxypropylene, polyoxyethylene ether of decyl alcohol that conforms generally to the formula where x has an average value of 14 and y has an average value of 6	$\text{CH}_3(\text{CH}_2)_9(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	surfactant – emulsifying agent
PPG-6-Decyltetradeceth-12 (72484-69-6) <sup>12</sup>	the polyoxypropylene, polyoxyethylene ether of Decyltetradecanol (q.v.) that conforms generally to the formula where x has an average value of 6 and y has an average value of 12	$(\text{CH}_2)_9\text{CH}_3$ $\text{CH}_3(\text{CH}_2)_{11}\text{CHCH}_2\text{O}(\text{CH}_2\text{CHO})_x(\text{CH}_2\text{CH}_2\text{O})_y\text{H}$   CH <sub>3</sub>	surfactant – emulsifying agent
PPG-6-Decyltetradeceth-20 (72484-69-6) <sup>13</sup>	the polyoxypropylene, polyoxyethylene ether of Decyltetradecanol (q.v.) that conforms generally to the formula where x has an average value of 6 and y has an average value of 20	$(\text{CH}_2)_9\text{CH}_3$ $\text{CH}_3(\text{CH}_2)_{11}\text{CHCH}_2\text{O}(\text{CH}_2\text{CHO})_x(\text{CH}_2\text{CH}_2\text{O})_y\text{H}$   CH <sub>3</sub>	surfactant – emulsifying agent
PPG-6-Decyltetradeceth-30 (72484-69-6) <sup>14</sup>	the polyoxypropylene, polyoxyethylene ether of Decyltetradecanol (q.v.) that conforms generally to the formula where x has an average value of 6 and y has an average value of 30	$(\text{CH}_2)_9\text{CH}_3$ $\text{CH}_3(\text{CH}_2)_{11}\text{CHCH}_2\text{O}(\text{CH}_2\text{CHO})_x(\text{CH}_2\text{CH}_2\text{O})_y\text{H}$   CH <sub>3</sub>	surfactant – emulsifying agent
PPG-13-Decyltetradeceth-24	the polyoxypropylene, polyoxyethylene ether of Decyltetradecanol (q.v.) that conforms generally to the formula where x has an average value of 13 and y has an average value 24	$(\text{CH}_2)_9\text{CH}_3$ $\text{CH}_3(\text{CH}_2)_{11}\text{CHCH}_2\text{O}(\text{CH}_2\text{CHO})_x(\text{CH}_2\text{CH}_2\text{O})_y\text{H}$   CH <sub>3</sub>	surfactant – emulsifying agent

**Table 2. Definitions, Structures, and Functions**

<b>Ingredient (CAS No. if available)</b>	<b>Definition<sup>1</sup></b>	<b>Structure<sup>1 ;CIR staff*</sup></b>	<b>Function</b>
PPG-20-Decyltetradeceth-10	the polyoxypropylene, polyoxyethylene ether of Decyltetradecanol (q.v.) that conforms generally to the formula where x has an average value of 20 and y has an average value of 10		surfactant – emulsifying agent
PPG-9-Ethylhexeth-5 (64366-70-7)	the polyoxypropylene, polyoxyethylene ether of octyl alcohol that conforms generally to the formula where x has an average value of 9 and y has an average value of 5		surfactant – emulsifying agent
PPG-1-Isodeceth-4	the polyoxyethylene, polyoxypropylene ether of isodecyl alcohol that conforms generally to the formula where x has an average value of 1 and y has an average value of 4 (a.k.a. Propylene Glycol Isodeceth-4) <sup>42</sup>		surfactant- cleansing and emulsifying agent
PPG-1-Isodeceth-6	is the polyoxyethylene, polyoxypropylene ether of isodecyl alcohol that conforms generally to the formula where x has an average value of 1 and y has an average value of 6		surfactant- cleansing and emulsifying agent
PPG-1-Isodeceth-7	the polyoxyethylene, polyoxypropylene ether of isodecyl alcohol that conforms generally to the formula where x has an average value of 1 and y has an average value of 7		surfactant- cleansing and emulsifying agent
PPG-1-Isodeceth-9	the polyoxyethylene, polyoxypropylene ether of isodecyl alcohol that conforms generally to the formula where x has an average value of 1 and y has an average value of 9		surfactant- cleansing and emulsifying agent
PPG-2-Isodeceth-4 (155683-77-5) <sup>36</sup>	the polyoxypropylene, polyoxyethylene glycol ether of isodecyl alcohol that conforms generally to the formula where x has an average value of 2 and y has an average value of 4		surfactant – emulsifying agent
PPG-2-Isodeceth-6 (155683-77-5) <sup>36</sup>	the polyoxyethylene, polyoxypropylene ether of isodecyl alcohol that conforms generally to the formula where x has an average value of 2 and y has an average value of 6		surfactant – emulsifying agent
PPG-2-Isodeceth-8 (155683-77-5) <sup>36</sup>	the polyoxyethylene, polyoxypropylene ether of isodecyl alcohol that conforms generally to the formula where x has an average value of 2 and y has an average value of 8		surfactant- cleansing and emulsifying agent
PPG-2-Isodeceth-9 (155683-77-5) <sup>36</sup>	the polyoxypropylene, polyoxyethylene ether of isodecyl alcohol that conforms generally to the formula where x has an average value of 2 and y has an average value of 9		surfactant – emulsifying agent
PPG-2-Isodeceth-10 (155683-77-5) <sup>36</sup>	the polyoxypropylene, polyoxyethylene ether of isodecyl alcohol that conforms generally to the formula: (structure) where x has an average value of 2 and y has an average value of 10		surfactant- cleansing and emulsifying agent
PPG-2-Isodeceth-12 (155683-77-5) <sup>36</sup>	the polyoxypropylene, polyoxyethylene ether of isodecyl alcohol that conforms generally to the formula: (structure) where x has an average value of 2 and y has an average value of 12		surfactant – emulsifying agent

**Table 2. Definitions, Structures, and Functions**

<b>Ingredient (CAS No. if available)</b>	<b>Definition<sup>1</sup></b>	<b>Structure<sup>1 ;CIR staff*</sup></b>	<b>Function</b>
PPG-2-Isodeceth-18 (155683-77-5) <sup>36</sup>	the polyoxypropylene, polyoxyethylene ether of isodecyl alcohol that conforms generally to the formula:(structure)where x has an average value of 2 and y has an average value of 18	$\text{C}_{10}\text{H}_{21}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	surfactant- cleansing and emulsifying agent
PPG-2-Isodeceth-25 (155683-77-5) <sup>36</sup>	the polyoxypropylene, polyoxyethylene ether of isodecyl alcohol that conforms generally to the formula:(structure)where x has an average value of 2 and y has an average value of 25	$\text{C}_{10}\text{H}_{21}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	surfactant- cleansing and emulsifying agent
PPG-3-Isodeceth-1 (155683-77-5) <sup>36</sup>	the polyoxypropylene, polyoxyethylene ether of isodecyl alcohol that conforms generally to the formula where x has an average value of 3 and y has an average value of 1	$\text{C}_{10}\text{H}_{21}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	skin conditioning agent - emollient
PPG-4-Isodeceth-10	the polyoxypropylene, polyoxyethylene ether of isodecyl alcohol that conforms generally to the formula where x has an average value of 4 and y has an average value of 10	$\text{C}_{10}\text{H}_{21}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	surfactant- cleansing and emulsifying agent
PPG-3-Isosteareth-9	the polyoxypropylene, polyoxyethylene ether of Isostearyl Alcohol (q.v.) that conforms generally to the formula where x has an average value of 3 and y has an average value of 9	$\text{C}_{17}\text{H}_{35}\overset{\text{O}}{\parallel}\text{C}-(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	surfactant- emulsifying agent
PPG-2-Laureth-5	the polyoxypropylene, polyoxyethylene ether of Lauryl Alcohol (q.v.) that conforms generally to the formula where x has an average value of 2 and y has an average value of 5	$\text{CH}_3(\text{CH}_2)_{10}\text{CH}_2(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	skin conditioning agent – emollient; surfactant- emulsifying agent
PPG-2-Laureth-8	the polyoxypropylene, polyoxyethylene ether of Lauryl Alcohol (q.v.) that conforms generally to the formula where x has an average value of 2 and y has an average value of 5	$\text{CH}_3(\text{CH}_2)_{10}\text{CH}_2(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	skin conditioning agent – emollient; surfactant- emulsifying agent
PPG-2-Laureth-12	the polyoxypropylene, polyoxyethylene ether of Lauryl Alcohol (q.v.) that conforms generally to the formula where x has an average value of 12 and y has an average value of 2	$\text{CH}_3(\text{CH}_2)_{10}\text{CH}_2(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	surfactant- emulsifying agent
PPG-3-Laureth-8	the polyoxypropylene, polyoxyethylene ether of Lauryl Alcohol (q.v.) that conforms generally to the formula where x has an average value of 3 and y has an average value of 8	$\text{CH}_3(\text{CH}_2)_{11}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	surfactant- emulsifying agent
PPG-3-Laureth-9	the polyoxypropylene, polyoxyethylene ether of Lauryl Alcohol (q.v.) that conforms generally to the formula where x has an average value of 3 and y has an average value of 9	$\text{CH}_3(\text{CH}_2)_{11}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	surfactant- emulsifying agent
PPG-3-Laureth-10	the polyoxypropylene, polyoxyethylene derivative of Lauryl Alcohol (q.v.) that conforms generally to the formula where x has an average value of 3 and y has an average value of 10	$\text{CH}_3(\text{CH}_2)_{11}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	surfactant- emulsifying agent

**Table 2. Definitions, Structures, and Functions**

<b>Ingredient (CAS No. if available)</b>	<b>Definition<sup>1</sup></b>	<b>Structure<sup>1, CIR staff*</sup></b>	<b>Function</b>
PPG-3-Laureth-12 (68439-51-0) <sup>36</sup>	the polyoxypropylene, polyoxyethylene derivative of Lauryl Alcohol (q.v.) that conforms generally to the formula where x has an average value of 3 and y has an average value of 12	$\begin{array}{c} \text{CH}_3(\text{CH}_2)_{11}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH} \\   \\ \text{CH}_3 \end{array}$	surfactant- emulsifying agent
PPG-4 Laureth-2 (68439-51-0) <sup>36</sup>	the polyoxypropylene, polyoxyethylene ether of Lauryl Alcohol (q.v.) that conforms to the formula where x has an average value of 4 and y has an average value of 2	$\begin{array}{c} \text{CH}_3(\text{CH}_2)_{11}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH} \\   \\ \text{CH}_3 \end{array}$	skin conditioning agent – emollient; surfactant- emulsifying agent
PPG-4 Laureth-5 (68439-51-0) <sup>36</sup>	the polyoxypropylene, polyoxyethylene ether of Lauryl Alcohol (q.v.) that conforms generally to the formula: (structure) where x has an average of 4 and y has an average value of 5	$\begin{array}{c} \text{CH}_3(\text{CH}_2)_{11}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH} \\   \\ \text{CH}_3 \end{array}$	skin conditioning agent – emollient; surfactant- emulsifying agent
PPG-4 Laureth-7	the polyoxypropylene, polyoxyethylene ether of Lauryl Alcohol (q.v.) that conforms generally to the formula where x has an average value of 4 and y has an average value of 7	$\begin{array}{c} \text{CH}_3(\text{CH}_2)_{11}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH} \\   \\ \text{CH}_3 \end{array}$	skin conditioning agent – emollient; surfactant- emulsifying agent
PPG-4-Laureth-15	the polyoxyethylene, polyoxypropylene ether of Lauryl Alcohol (q.v.) that conforms generally to the formula where x has an average value of 4 and y has an average value of 15	$\begin{array}{c} \text{CH}_3(\text{CH}_2)_{10}\text{CH}_2(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH} \\   \\ \text{CH}_3 \end{array}$	skin conditioning agent – emollient; surfactant- emulsifying agent
PPG-5-Laureth-5	the polyoxyethylene, polyoxypropylene ether of lauryl alcohol that conforms generally to the formula where x has an average value of 5 and y has an average value of 5	$\begin{array}{c} \text{CH}_3(\text{CH}_2)_{11}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH} \\   \\ \text{CH}_3 \end{array}$	skin conditioning agent – emollient; surfactant- emulsifying agent
PPG-6-Laureth-3	the polyoxypropylene, polyoxyethylene ether of lauryl alcohol that conforms generally to the formula where x has an average value of 6 and y has an average value of 3	$\begin{array}{c} \text{CH}_3(\text{CH}_2)_{11}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH} \\   \\ \text{CH}_3 \end{array}$	skin conditioning agent – emollient; surfactant- emulsifying agent
PPG-25-Laureth-25 (37311-00-5; 68238-81-3 <sup>36</sup> )	the polyoxypropylene, polyoxyethylene ether of Lauryl Alcohol (q.v.) that conforms generally to the formula where x has an average value of 25 and y has an average value of 25	$\begin{array}{c} \text{CH}_3(\text{CH}_2)_{11}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH} \\   \\ \text{CH}_3 \end{array}$	surfactant- emulsifying agent
PPG-3-Myreth-3 (37311-04-9)	the polyoxypropylene, polyoxyethylene ether of myristyl alcohol that conforms generally to the formula where x has an average value of 3 and y has an average value of 3	$\begin{array}{c} \text{CH}_3(\text{CH}_2)_{13}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH} \\   \\ \text{CH}_3 \end{array}$	skin conditioning agent – emollient; surfactant- emulsifying agent
PPG-3-Myreth-11 (37311-04-9)	the polyoxypropylene, polyoxyethylene ether of myristyl alcohol that conforms generally to the formula where x has an average value of 3 and y has an average value of 11	$\begin{array}{c} \text{CH}_3(\text{CH}_2)_{13}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH} \\   \\ \text{CH}_3 \end{array}$	surfactant- emulsifying agent
PPG-2-PEG-11 Hydrogenated Lauryl Alcohol Ether	a polyoxypropylene, polyoxyethylene ether of hydrogenated lauryl alcohol that conforms generally to the formula where x has an average value of 2, y has an average value of 11, and R represents the alkyl groups derived from hydrogenated lauryl alcohol	$\begin{array}{c} \text{R}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH} \\   \\ \text{CH}_3 \end{array}$	surfactant- emulsifying agent
PPG-3-PEG-6 Oleyl Ether	the polyoxypropylene, polyoxyethylene derivative of oleyl alcohol that conforms to the formula where x has an average value of 3 and y has an average value of 6	$\begin{array}{c} \text{CH}_3(\text{CH}_2)_7\text{CH}=\text{CH}(\text{CH}_2)_8(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{H} \\   \\ \text{CH}_3 \end{array}$	surfactant- emulsifying agent

**Table 2. Definitions, Structures, and Functions**

Ingredient (CAS No. if available)	Definition <sup>1</sup>	Structure <sup>1,2;CIR staff*</sup>	Function
PPG-9-Steareth-3 (9038-43-1)	the polyoxypropylene, polyoxyethylene ether of stearyl alcohol that conforms generally to the formula where x has an average value of 9 and y has an average value of 3	$\text{CH}_3(\text{CH}_2)_{17}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	skin conditioning agent – emollient
PPG-23-Steareth-34 (9038-43-1)	the polyoxypropylene, polyoxyethylene ether of stearyl alcohol that conforms generally to the formula where x has an average value of 23 and y has an average value of 34	$\text{CH}_3(\text{CH}_2)_{17}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	skin conditioning agent – emollient; surfactant-emulsifying agent
PPG-30 Steareth-4	the polyoxypropylene, polyoxyethylene ether of stearyl alcohol that conforms generally to the formula where x has an average value of 30 and y has an average value of 4	$\text{CH}_3(\text{CH}_2)_{17}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	skin conditioning agent – emollient; surfactant-emulsifying agent
PPG-34-Steareth-3	the polyoxypropylene, polyoxyethylene ether of stearyl alcohol that conforms generally to the formula where x has an average value of 34 and y has an average value of 3	$\text{CH}_3(\text{CH}_2)_{17}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	skin conditioning agent – emollient; surfactant-emulsifying agent
PPG-38 Steareth-6	the polyoxypropylene, polyoxyethylene ether of stearyl alcohol that conforms generally to the formula where x has an average value of 38 and y has an average value of 6	$\text{CH}_3(\text{CH}_2)_{17}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	skin conditioning agent – emollient; surfactant-emulsifying agent
PPG-1 Trideceth- 6	the polyoxypropylene, polyoxyethylene ether of tridecyl alcohol that conforms generally to the formula where x has an average value of 1 and y has an average value of 6	$\text{CH}_3(\text{CH}_2)_{12}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	skin conditioning agent – emollient; surfactant-emulsifying agent
PPG-1 Trideceth-13	the polyoxypropylene, polyoxyethylene ether of tridecyl alcohol that conforms generally to the formula where x has an average value of 1 and y has an average value of 13	$\text{CH}_3(\text{CH}_2)_{12}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	skin conditioning agent – emollient; surfactant-emulsifying agent
PPG-4 Trideceth-6 (65150-81-4) <sup>36</sup>	the polyoxypropylene, polyoxyethylene ether of tridecyl alcohol that conforms generally to the formula where x has an average value of 4 and y has an average value of 6	$\text{CH}_3(\text{CH}_2)_{12}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	skin conditioning agent – emollient; surfactant-emulsifying agent
PPG-6 Trideceth-8	the polyoxypropylene, polyoxyethylene ether of tridecyl alcohol that conforms generally to the formula where x has an average value of 6 and y has an average value of 8	$\text{CH}_3(\text{CH}_2)_{12}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	skin conditioning agent – emollient; surfactant-emulsifying agent
Propylene Glycol Capreth-4	the propylene glycol ether of a polyethylene glycol derivative of capryl alcohol that conforms generally to the formula where n has an average value of 4	$\text{CH}_3(\text{CH}_2)_9\text{OCHCH}_2(\text{OCH}_2\text{CH}_2)_n\text{OH}$   CH <sub>3</sub>	surfactant- emulsifying agent
Propylene Glycol Isodeceth-4	the propylene glycol ether of ethoxylated isodecyl alcohol that conforms generally to the formula where x has an average value of 1 and y has an average value of 4 (a.k.a. PPG-1-Isodeceth-4) <sup>42</sup>	$\text{C}_{10}\text{H}_{21}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	surfactant- emulsifying agent
Propylene Glycol Isodeceth-12	the propylene glycol ether of ethoxylated isodecyl alcohol that conforms generally to the formula where x has an average value of 1 and y has an average value of 12	$\text{C}_{10}\text{H}_{21}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	surfactant- emulsifying agent
Propylene Glycol Laureth-6	the propylene glycol ether of Laureth-6 (q.v.) that conforms generally to the formula where x has an average value of 1 and y has an average value of 6	$\text{CH}_3(\text{CH}_2)_{11}(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH}$   CH <sub>3</sub>	surfactant- emulsifying agent

**Table 2. Definitions, Structures, and Functions**

Ingredient (CAS No. if available)	Definition <sup>1</sup>	Structure <sup>1,2;CIR staff*</sup>	Function
Propylene Glycol Oleth-5	the propylene glycol ether of Oleth-5 (q.v.) that conforms generally to the formula where x has an average value of 1 and y has an average value of 5	$\begin{array}{c} \text{CH}(\text{CH}_2)_7\text{CH}_3 \\    \\ \text{CH}(\text{CH}_2)_8(\text{OCHCH}_2)_x(\text{OCH}_2\text{CH}_2)_y\text{OH} \\   \\ \text{CH}_3 \end{array}$	surfactant- emulsifying agent

\*when available, the structure depicted in the *International Cosmetic Ingredient Dictionary and Handbook* were used; when there was not structure available, CIR staff drew the structure

**Table 3. Physical and Chemical Properties**

Property	Description	Reference
	<b>PPG-5 C9-15 Parth-6</b>	
physical state and appearance	colorless to yellowish liquid	22
active content	100%	22
solubility	soluble in water	22
stability	stable in acid and alkali	22
	<b>PPG-3 C12-14 Sec-Pareth-7</b>	
odor	odorless	9
specific gravity	0.969 (20/20°C)	9
stability	stable to both acid and alkali; do not react with water or air under normal conditions	9
	<b>PPG-4 C12-14 Sec-Pareth-5</b>	
odor	odorless	9
specific gravity	0.956 (20/20°C)	9
stability	stable to both acid and alkali; do not react with water or air under normal conditions	9
	<b>PPG-5 C12-14 Sec-Pareth-7</b>	
odor	odorless	9
specific gravity	0.975 (20/20°C)	9
stability	stable to both acid and alkali; do not react with water or air under normal conditions	9
	<b>PPG-5 C12-14 Sec-Pareth-9</b>	
odor	odorless	9
specific gravity	0.979 (20/20°C)	9
stability	stable to both acid and alkali; do not react with water or air under normal conditions	9
	<b>PPG-2 C12-15 Pareth-6</b>	
physical state	liquid	11
active content	100% by wt	11
	<b>PPG-4-Ceteth-1</b>	
physical state and appearance	colorless to pale yellow liquid	4
	<b>PPG-4-Ceteth-10</b>	
physical state and appearance	colorless liquid	16
	colorless to pale yellow petrolatum-like substance	5
	<b>PPG-4-Ceteth-20</b>	
physical state and appearance	white solid	17
	colorless to pale yellow waxy substance	6
	<b>PPG-5-Ceteth-20</b>	
physical state	liquid	8
	clear to slightly hazy liquid	18
boiling point	310.9°C (760 mm Hg)	3
solubility	soluble in water and isopropanol dispersible in mineral oil	8
	<b>PPG-8-Ceteth-1</b>	
physical state and appearance	colorless liquid	19
	<b>PPG-8-Ceteth-20</b>	
physical state and appearance	yellow solid	20
	<b>PPG-2-Deceth-3</b>	
physical state and appearance	slightly yellow oil	10
	<b>PPG-2-Deceth-5</b>	
physical state and appearance	slightly yellow oil	10
	<b>PPG-2-Deceth-7</b>	
physical state and appearance	slightly yellow turbid oil	10
	<b>PPG-2-Deceth-8</b>	
physical state and appearance	clear liquid	2
active content	90% (water content; 10%)	2
density	1020 kg/m <sup>3</sup> (20°C)	2
solubility	soluble in water, ethanol, propylene glycol, and 2-propanol dispersible in low aromatic solvent, white spirit, and xylene	2
	<b>PPG-2-Deceth-10</b>	
physical state and appearance	slightly yellow soft paste	10
	<b>PPG-2-Deceth-12</b>	
physical state and appearance	slightly yellow soft paste	10
	<b>PPG-2-Deceth-15</b>	
physical state and appearance	slightly yellow soft wax	10
	<b>PPG-2-Deceth-20</b>	
physical state and appearance	slightly yellow soft wax	10
	<b>PPG-2-Deceth-30</b>	
physical state and appearance	slightly yellow soft wax	10
	<b>PPG-6-Deceth-4</b>	
physical state	liquid	11
active content	100% by wt	11
	<b>PPG-6-Deceth-9</b>	
physical state	liquid	11
active content	100% by wt	11

**Table 3. Physical and Chemical Properties**

Property	Description	Reference
<b><i>PPG-8-Deceth-6</i></b>		
physical state	liquid	11
active content	100% by wt	11
<b><i>PPG-6 Decyltetradeceth-12</i></b>		
physical state and appearance	yellow solid	12
<b><i>PPG-6-Decyltetradeceth-20</i></b>		
physical state and appearance	yellow solid	13
<b><i>PPG-6-Decyltetradeceth-30</i></b>		
physical state and appearance	yellow solid	14
<b><i>PPG-9-Ethylhexeth-5</i></b>		
physical state and appearance	colorless to yellow liquid with a mild odor	7
boiling point	decomposes prior to boiling	7
<b><i>PPG-3-Isodeceth-1</i></b>		
physical state	liquid	15
<b><i>PPG-4-Laureth-2</i></b>		
physical state	liquid	11
active content	100%	11
<b><i>PPG-4-Laureth-5</i></b>		
physical state	liquid	11
active content	100%	11
<b><i>PPG-25-Laureth-25</i></b>		
physical state and appearance	colorless or pale yellow liquid	21
	colorless or straw-colored clear liquid	27
solubility	soluble in water	21
density	1.046±2%	27
pH	6.8±0.4	27
<b><i>PPG-1 Trideceth-13</i></b>		
physical state and appearance	colorless liquid	23
active content	95%	23
solubility	soluble in water	23
<b><i>Propylene Glycol Oleth-5</i></b>		
physical state	liquid	11
active content	100%	11

**Table 4. Frequency and concentration of use according to duration and type of exposure**

	# of Uses	Max Conc of Use (%)**	# of Uses	Max Conc of Use (%)**	# of Uses	Max Conc of Use (%)**
	PEG/PPG-14/7 Dimethyl Ether		PEG/PPG-17/14 Dimethyl Ether		PEG/PPG-36/41 Dimethyl Ether	
<b>Totals*</b>	<b>33</b>		<b>10</b>		<b>189</b>	
<i>Duration of Use</i>						
Leave-On	32		10		189	
Rinse-Off	1		NR		NR	
Diluted for (Bath) Use	NR		NR		NR	
<i>Exposure Type</i>						
Eye Area	NR		NR		77	
Incidental Ingestion	NR		NR		25	
Incidental Inhalation-Spray	1 <sup>a</sup>		NR		NR	
Incidental Inhalation-Powder	NR		NR		6	
Dermal Contact	33		10		163	
Deodorant (underarm)	NR		NR		NR	
Hair - Non-Coloring	NR		NR		NR	
Hair-Coloring	NR		NR		NR	
Nail	NR		NR		NR	
Mucous Membrane	NR		NR		25	
Baby Products	NR		NR		NR	

**Table 4. Frequency and concentration of use according to duration and type of exposure**

	# of Uses PEG/PPG-50/40 Dimethyl Ether	# of Uses PPG-2-Ceteareth-9	# of Uses PPG-2-Ceteth-10
<b>Totals*</b>	<b>2</b>	<b>9</b>	<b>1</b>
<b>Duration of Use</b>			
Leave-On	NR	5	1
Rinse Off	2	4	NR
Diluted for (Bath) Use	NR	NR	NR
<b>Exposure Type</b>			
Eye Area	NR	NR	NR
Incidental Ingestion	NR	NR	NR
Incidental Inhalation-Spray	NR	NR	NR
Incidental Inhalation-Powder	NR	NR	NR
Dermal Contact	2	9	1
Deodorant (underarm)	NR	NR	NR
Hair - Non-Coloring	NR	1	NR
Hair-Coloring	NR	NR	NR
Nail	NR	NR	NR
Mucous Membrane	NR	NR	NR
Baby Products	NR	NR	NR
	<b>PPG-4-Ceteth-20</b>	<b>PPG-5-Ceteth-20</b>	<b>PPG-8-Ceteth-20</b>
<b>Totals*</b>	<b>2</b>	<b>414</b>	<b>5</b>
<b>Duration of Use</b>			
Leave-On	2	214	4
Rinse-Off	NR	189	1
Diluted for (Bath) Use	NR	11	NR
<b>Exposure Type</b>			
Eye Area	NR	5	NR
Incidental Ingestion	NR	NR	NR
Incidental Inhalation-Spray	NR	27 <sup>a,b</sup>	NR
Incidental Inhalation-Powder	NR	NR	NR
Dermal Contact	2	170	5
Deodorant (underarm)	NR	4	NR
Hair - Non-Coloring	NR	232	NR
Hair-Coloring	NR	6	NR
Nail	NR	2	NR
Mucous Membrane	NR	51	NR
Baby Products	NR	NR	NR
	<b>PPG-2-Deceth-12</b>	<b>PPG-6-Decyltetradeceth-20</b>	<b>PPG-6-Decyltetradeceth-30</b>
<b>Totals</b>	<b>1</b>	<b>2</b>	<b>16</b>
<b>Duration of Use</b>			
Leave-On	NR	2	13
Rinse Off	1	NR	3
Diluted for (Bath) Use	NR	NR	NR
<b>Exposure Type</b>			
Eye Area	NR	NR	NR
Incidental Ingestion	NR	NR	NR
Incidental Inhalation-Spray	NR	NR	NR
Incidental Inhalation-Powder	NR	NR	NR
Dermal Contact	NR	2	16 <sup>a</sup>
Deodorant (underarm)	NR	NR	NR
Hair - Non-Coloring	NR	NR	NR
Hair-Coloring	1	NR	NR
Nail	NR	NR	NR
Mucous Membrane	NR	NR	NR
Baby Products	NR	NR	NR

**Table 4. Frequency and concentration of use according to duration and type of exposure**

	# of Uses PPG-13-Decyltetradeceth-24	# of Uses PPG-20-Decyltetradeceth-10	# of Uses PPG-30-Decyltetradeceth-10 <sup>#</sup>
<b>Totals*</b>	<b>36</b>	<b>3</b>	<b>1</b>
<b>Duration of Use</b>			
Leave-On	33	2	NR
Rinse-Off	3	1	1
Diluted for (Bath) Use	NR	NR	NR
<b>Exposure Type</b>			
Eye Area	NR	NR	NR
Incidental Ingestion	NR	NR	NR
Incidental Inhalation-Spray	1 <sup>a</sup>	NR	NR
Incidental Inhalation-Powder	NR	NR	NR
Dermal Contact	33	2	1
Deodorant (underarm)	NR	NR	NR
Hair - Non-Coloring	NR	1	NR
Hair-Coloring	NR	NR	NR
Nail	NR	NR	NR
Mucous Membrane	NR	NR	NR
Baby Products	NR	NR	NR
	<b>PPG-2-Isodeceth-12</b>	<b>PPG-3-Isosteareth-9</b>	<b>PPG-5-Laureth-5</b>
<b>Totals*</b>	<b>4</b>	<b>3</b>	<b>9</b>
<b>Duration of Use</b>			
Leave-On	1	3	5
Rinse-Off	3	NR	3
Diluted for (Bath) Use	NR	NR	1
<b>Exposure Type</b>			
Eye Area	NR	NR	NR
Incidental Ingestion	NR	NR	NR
Incidental Inhalation-Spray	NR	2 <sup>b</sup>	NR
Incidental Inhalation-Powder	NR	NR	NR
Dermal Contact	2	3	8
Deodorant (underarm)	NR	NR	2 <sup>b</sup>
Hair - Non-Coloring	2	NR	1
Hair-Coloring	NR	NR	NR
Nail	NR	NR	NR
Mucous Membrane	NR	NR	1
Baby Products	NR	NR	NR
	<b>PPG-25-Laureth-25</b>	<b>PPG-1-Trideceth-6</b>	
<b>Totals</b>	<b>31</b>	<b>221</b>	
<b>Duration of Use</b>			
Leave-On	27	124	
Rinse Off	4	97	
Diluted for (Bath) Use	NR	NR	
<b>Exposure Type</b>			
Eye Area	1	NR	
Incidental Ingestion	NR	NR	
Incidental Inhalation-Spray	NR	NR	
Incidental Inhalation-Powder	NR	NR	
Dermal Contact	29	38	
Deodorant (underarm)	NR	NR	
Hair - Non-Coloring	2	164	
Hair-Coloring	NR	14	
Nail	NR	5	
Mucous Membrane	NR	NR	
Baby Products	1	NR	

\*Because each ingredient may be used in cosmetics with multiple exposure types, the sum of all exposure types may not equal the sum of total uses.

\*\*The results of a Council survey of maximum use concentrations are still pending.

# included in the VCRP, but not listed in the *International Cosmetic Ingredient Dictionary and Handbook*

<sup>a</sup> Includes suntan products, in that it is not known whether or not the reported product is a spray.

<sup>b</sup> Includes products for which it is not known whether or not the product is a spray.

NR – none reported

**Table 5. No reported use according to the VCRP**<sup>31</sup>

PEG-4-PPG-7 C13/C15 Alcohol	PPG-2 C12-15 Pareth-6	PPG-2-Isodeceth-6
PEG/PPG-3/6 Dimethyl Ether	PPG-4 C13-15 Pareth-15	PPG-2-Isodeceth-8
PEG/PPG-7/12 Dimethyl Ether	PPG-5 C9-15 Pareth-6	PPG-2-Isodeceth-9
PEG/PPG-9/2 Dimethyl Ether	PPG-6 C9-11 Pareth-5	PPG-2-Isodeceth-10
PEG/PPG-22/40 Dimethyl Ether	PPG-6 C12-15 Pareth-12	PPG-2-Isodeceth-18
PEG/PPG-27/14 Dimethyl Ether	PPG-6 C12-18 Pareth-11	PPG-2-Isodeceth-25
PEG/PPG-35/40 Dimethyl Ether	PPG-3 C12-14 Sec-Pareth-7	PPG-3-Isodeceth-1
PEG/PPG-52/32 Dimethyl Ether	PPG-4 C12-14 Sec-Pareth-5	PPG-4-Isodeceth-10
PEG/PPG-55/28 Dimethyl Ether	PPG-5 C12-14 Sec-Pareth-7	PPG-2-Laureth-5
PEG/PPG-4/2 Propylheptyl Ether	PPG-5 C12-14 Sec-Pareth-9	PPG-2-Laureth-8
PEG/PPG-6/2 Propylheptyl Ether	PPG-1-Deceth-4	PPG-2-Laureth-12
PEG/PPG-7/2 Propylheptyl Ether	PPG-1-Deceth-5	PPG-3-Laureth-8
PEG/PPG-8/2 Propylheptyl Ether	PPG-1-Deceth-6	PPG-3-Laureth-9
PEG/PPG-10/2 Propylheptyl Ether	PPG-1-Deceth-7	PPG-3-Laureth-10
PEG/PPG-14/2 Propylheptyl Ether	PPG-2-Deceth-3	PPG-3-Laureth-12
PEG/PPG-40/2 Propylheptyl Ether	PPG-2-Deceth-5	PPG-4 Laureth-2
PPG-4-Ceteareth-12	PPG-2-Deceth-7	PPG-4 Laureth-5
PPG-10-Ceteareth-20	PPG-2-Deceth-8	PPG-4 Laureth-7
PPG-1-Ceteth-1	PPG-2-Deceth-12	PPG-4-Laureth-15
PPG-1-Ceteth-5	PPG-2-Deceth-15	PPG-6-Laureth-3
PPG-1-Ceteth-10	PPG-2-Deceth-20	PPG-3-Myreth-3
PPG-1-Ceteth-20	PPG-2-Deceth-30	PPG-3-Myreth-11
PPG-2-Ceteth-1	PPG-2-Deceth-40	PPG-2-PEG-11 Hydrogenated Lauryl Alcohol Ether
PPG-2-Ceteth-5	PPG-2-Deceth-50	PPG-3-PEG-6 Oleyl Ether
PPG-2-Ceteth-10	PPG-2-Deceth-60	PPG-9-Steareth-3
PPG-2-Ceteth-20	PPG-4-Deceth-4	PPG-23-Steareth-34
PPG-4-Ceteth-1	PPG-4-Deceth-6	PPG-30 Steareth-4
PPG-4-Ceteth-5	PPG-6-Deceth-4	PPG-34-Steareth-3
PPG-4-Ceteth-10	PPG-6-Deceth-9	PPG-38 Steareth-6
PPG-8-Ceteth-1	PPG-8-Deceth-6	PPG-1 Trideceth-13
PPG-8-Ceteth-2	PPG-14-Deceth-6	PPG-4 Trideceth-6
PPG-8-Ceteth-5	PPG-6-Decyltetradeceth-12	PPG-6 Trideceth-8
PPG-8-Ceteth-10	PPG-9-Ethylhexeth-5	Propylene Glycol Capreth-4
PPG-2 C9-11 Pareth-5	PPG-1-Isodeceth-4	Propylene Glycol Isodeceth-4
PPG-2 C9-11 Pareth-7	PPG-1-Isodeceth-6	Propylene Glycol Isodeceth-12
PPG-2 C9-11 Pareth-8	PPG-1-Isodeceth-7	Propylene Glycol Laureth-6
PPG-2 C9-11 Pareth-11	PPG-1-Isodeceth-9	Propylene Glycol Oleth-5
PPG-2 C12-13 Pareth-8	PPG-2-Isodeceth-4	

**Table 6. Examples of non-cosmetic uses**

Ingredient	Use	Reference
PPG-5 C9-15 Pareth-6	industrial washer and cleansing agents	<sup>22</sup>
PPG C12-14 sec-Pareths	nonionic surfactants in the paper and pulp, metal, textile, plastics and paint, pesticide, and leather and fur industries	<sup>9</sup>
PPG-2-Deceth-8	all-purpose cleaner and emulsifier in the paints and coatings	<sup>2</sup>

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