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# Safety Assessment of Citrus Flower- and Leaf-Derived Ingredients as Used in Cosmetics

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Status: Draft Report for Panel Review  
Release Date: November 20, 2015  
Panel Meeting Date: December 14-15, 2015

The 2015 Cosmetic Ingredient Review Expert Panel members are: Chairman, Wilma F. Bergfeld, M.D., F.A.C.P.; Donald V. Belsito, M.D.; Ronald A. Hill, Ph.D.; Curtis D. Klaassen, Ph.D.; Daniel C. Liebler, Ph.D.; James G. Marks, Jr., M.D., Ronald C. Shank, Ph.D.; Thomas J. Slaga, Ph.D.; and Paul W. Snyder, D.V.M., Ph.D. The CIR Director is Lillian J. Gill, D.P.A. This report was prepared by Christina Burnett, Senior Scientific Analyst/Writer.

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## Cosmetic Ingredient Review

1620 L Street NW, Suite 1200 ♦ Washington, DC 20036-4702 ♦ ph 202.331.0651 ♦ fax 202.331.0088 ♦  
cirinfo@cir-safety.org

Memorandum

To: CIR Expert Panel Members and Liaisons  
From: Christina Burnett, Senior Scientific Writer/Analyst  
Date: November 20, 2015  
Subject: Draft Report of the Safety Assessment of *Citrus* Flower- and Leaf-Derived Ingredients

Enclosed is the draft Report of the Safety Assessment of *Citrus* Flower- and Leaf-Derived Ingredients as Used in Cosmetics. (It is identified as *cleaf122015rep* in the pdf document.)

At the March 2014 meeting, the Panel tabled further discussion of 198 *Citrus*-derived ingredients to allow CIR staff to reorganize the report and to obtain clarification from the Research Institute for Fragrance Materials (RIFM) on the functions of some of the ingredients. Based on the Panel's recommendation of grouping the ingredients by plant parts according to greatest number of uses, the first two assessments reviewed by the Panel were *Citrus*-derived peel oils (14 ingredients; final report issued September 2014) and *Citrus* fruit-derived ingredients (80 ingredients; draft final report currently under Panel consideration). As it stands, the Panel has concluded that the ingredients in these two safety assessments are safe for use in both rinse-off and leave-on cosmetic products when formulated to be non-sensitizing and non-irritating, provided that leave-on products do not contain more than 0.0015% (15 ppm) 5-methoxypsoralen (5-MOP).

At the September 2015 meeting, the Panel finalized the groupings of the remaining ingredients. The Panel will be reviewing the safety of *Citrus* plant- and seed-derived ingredients (33 ingredients), *Citrus* flower- and leaf-derived ingredients (32 ingredients), and *Citrus* peel-derived ingredients (47 ingredients) in three separate, concurrent reports. The minutes from the September Panel meeting and the initial meeting on the full *Citrus* family of ingredients from 2014 can be found in the *Citrus* fruit-derived ingredients package (*cfruit122015min* under the bookmark tabs "Citrus Reminders Strategy September 21-22, 2015" and "Citrus-Derived Ingredients March 2014").

Since March 2014, no new unpublished data on *Citrus* flower- and leaf-derived ingredients have been received. The Council is currently performing a new concentration of use survey to update the data that was originally collected in 2013. An updated search of the published literature has found no relevant safety test data concerning the ingredients found in this report.

The *Citrus* flower- and leaf-derived ingredients described in this report function primarily as fragrances and/or skin conditioning agents. *Citrus aurantium amara* (bitter orange) flower oil has the most reported uses of the ingredients in this report in cosmetic products, with a total of 89; the majority of the uses are in leave-on skin care preparations. *Citrus aurantium dulcis* (orange) flower extract has the second greatest number of overall uses reported, with a total of 71; a majority of the uses are in rinse-off and leave-on skin care preparations. The results of the concentration of use survey indicate *Citrus aurantium amara* (bitter orange) flower extract has the highest reported maximum concentration of use; it is used at up to 5% in face and neck products. *Citrus aurantium amara* (bitter orange) flower water had the second highest reported maximum concentration of use; it is used at up to 4% in night skin care products.

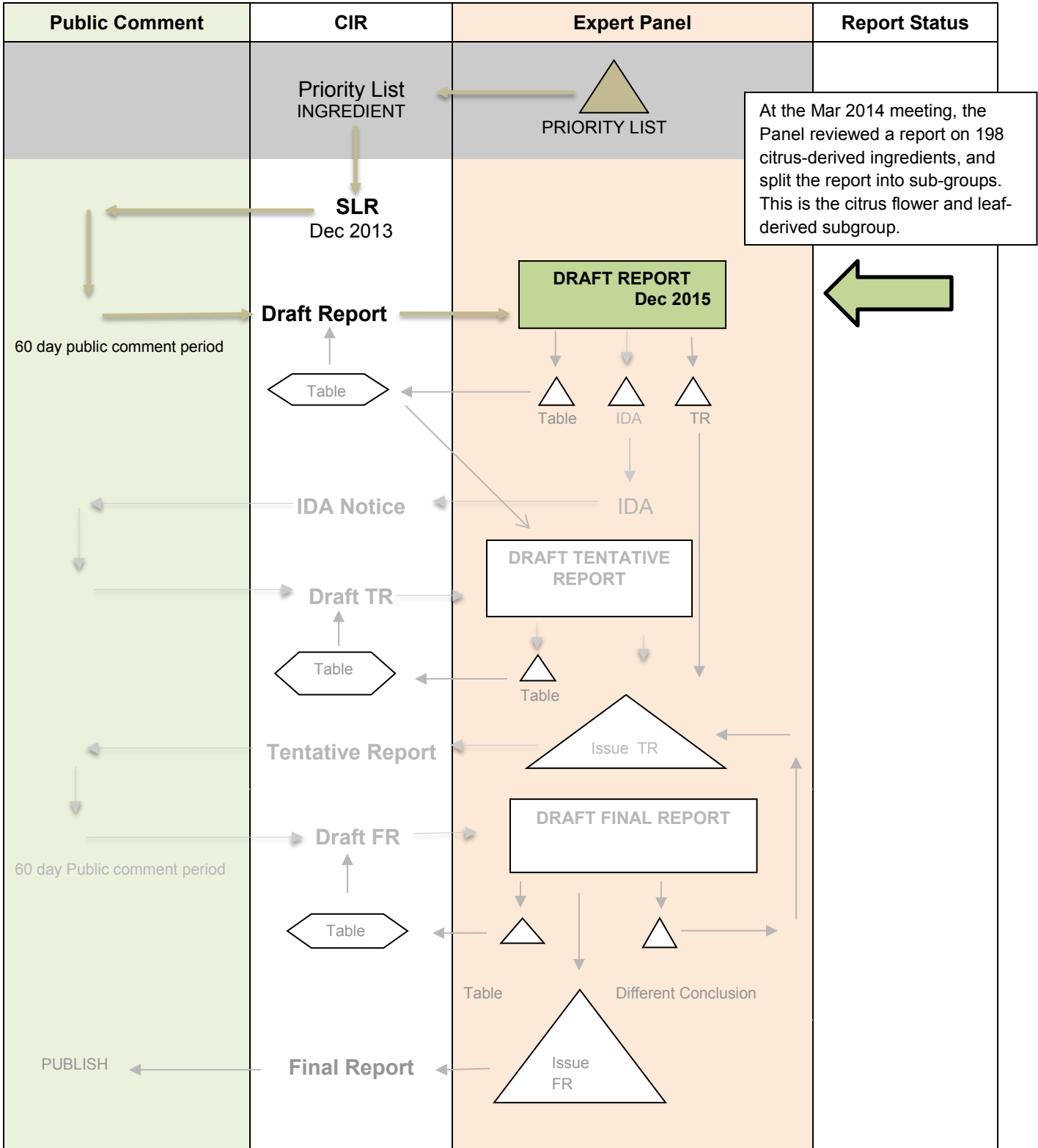
Discrepancies were found between the INCI Dictionary and the VCRP database during the creation of the Use Table. The VCRP included ingredients using old botanical nomenclature (e.g. *Citrus sinensis* instead of *Citrus aurantium dulcis* for sweet orange) and ingredients that do not have entries in the INCI Dictionary (e.g. kaffir lime (*Citrus hystrix*) leaf oil). These discrepancies have been footnoted in the Use Table.

If no further data are needed, the Panel should issue a Tentative Report. If data are needed, an Insufficient Data Announcement should be issued, and the data needs listed.

# SAFETY ASSESSMENT FLOW CHART

INGREDIENT/FAMILY Citrus Flower and Leaf-Derived Ingredients

MEETING Dec 2015



## **Citrus Flower- and Leaf-Derived Ingredients History**

**December 2013** – Scientific Literature Review announced.

**March 2014** - The Panel tabled further discussion of 198 citrus-derived ingredients to allow CIR staff to reorganize the report and to obtain clarification from RIFM on the functions of some of the ingredients. These ingredients were presented in a single safety assessment report addressing ingredients from all of the citrus plant species currently reported to be used in cosmetics in the International Cosmetic Ingredient Dictionary and Handbook. The Panel felt revising this report into smaller subgroups would be a manageable and meaningful alternative approach to assessing the safety of these ingredients. Based on the Panel's recommendation of grouping the ingredients by plant parts according to greatest number of uses, the first assessment reviewed by the Panel was citrus-derived peel oils, followed by citrus fruit-derived ingredients.

**September 2015** – The Panel reviewed the report strategy for the remaining citrus ingredients. The Panel agreed that the remaining ingredients could be divided into 3 reports: citrus flower- and leaf-derived ingredients, citrus peel-derived ingredients, and citrus plant- and seed-derived ingredients. These reports can be reviewed concurrently.

Citrus Flower- and Leaf-Derived Ingredients Data Profile – December 2015 – Writer, Christina Burnett										
	In-Use	Physical/Chemical Properties	Method of Manufacturing	Composition	Carcinogenicity	Irritation/Sensitization - Nonhuman	Irritation/Sensitization - Clinical	Ocular/Mucosal	Phototoxicity	Case Studies
citrus aurantifolia (lime) flower extract	X									
citrus aurantium amara (bitter orange) flower extract	X									
citrus aurantium amara (bitter orange) flower oil	X									
citrus aurantium amara (bitter orange) flower water	X									
citrus aurantium amara (bitter orange) flower wax	X		X	X		X				
citrus aurantium dulcis (orange) flower extract	X									
citrus aurantium dulcis (orange) flower oil	X									
citrus aurantium dulcis (orange) leaf extract	X									
citrus reticulata (tangerine) leaf oil	X									
bitter orange leaf oil (not INCI ingredient)						X	X		X	
kaffir lime (citrus hystrix) leaf oil (not INCI ingredient)	X									
NO USES OR DATA WERE AVAILABLE FOR THE REMAINING CITRUS INGREDIENTS LISTED IN TABLE 1.										

“X” indicates that data were available in the category for that ingredient.

### Search Strategy for Citrus Flower- and Leaf-Derived Ingredients

- August 2014 – miscellaneous searches for additional data on constituents
- SciFinder – February 26, 2013
  - Search for INCI citrus ingredients w/ CAS No. – 99 hits, 10 ordered
- PubMed – March 5, 2013
  - Search for “citrus cosmetics” – 65 hits, 1 ordered
  - Search for “citrus sensitization” – 36 hits, 8 ordered
  - Search for “citrus dermal” – 12 hits, 0 ordered
  - Search for “citrus phototoxicity” – 24 hits, 10 ordered
- SciFinder – Aug 19 2013
  - toxicity of citrus ingredients – 11 hits; 1 ordered
  - carcinogenicity of citrus – 466 hits; 8 ordered
- SciFinder – Aug 20, 2013
  - Phototoxicity of citrus – 47 hits; 21 ordered
  - Dermal effects of citrus – 51 hits; 1 new ref found
  - Dermal absorption of citrus – 1 hit; not useful
  - Constituents of citrus – 116 hits;
  - Citrus – Belsito, Marks, Bergfeld, Api, RIFM– 2 found

Ordered a few others; printed some directly

Updated searches in November, 2013 – ordered an additional 4 references

Updated searches July 2015 with the term “citrus” – 1 new relevant reference found.

**Updated searches October 2015 with the term “citrus AND flower AND toxicity”, “citrus AND flower AND irritation”, “citrus AND leaf AND toxicity”, and “citrus AND leaf AND irritation” – 0 new relevant references found.**

#### Online Info

- FDA
  - GRAS definitions
- Dr. Duke’s Phytochemical and Ethnobotanical Databases
  - Due to volume of data, limited search to Citrus limon (Lemon), Citrus aurantifolia (Lime), Citrus paradisi (Grapefruit), Citrus sinensis (Sweet Orange), and Citrus aurantium (Bitter Orange)
- National Toxicology Program (NTP)
  - Bitter Orange Extract (mixture)
- SCCS/SCCP
  - Opinion on fragrance allergens in cosmetic products
  - Opinion on Furocoumarins in cosmetic products
- Sigma Aldrich
  - Citrus aurantiifolia (lime)
  - Citrus aurantium (bitter orange)
  - Citrus paradisi (grapefruit)
  - Citrus reticulata (tangerine)
- IFRA
  - 7-methoxycoumarin
  - Standard for citrus oils and other furocoumarins containing essential oils. Ingredients include:

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## INTRODUCTION

*Citrus* flower- and leaf-derived ingredients are widely used in cosmetics, and are most frequently reported to function in cosmetics as fragrances and/or skin conditioning agents (Table 1).<sup>1</sup> This report assesses the safety of the following 32 ingredients:

citrus aurantifolia (lime) flower extract	citrus grandis (grapefruit) leaf extract
citrus aurantifolia (lime) leaf oil	citrus hystrix leaf extract
citrus aurantium amara (bitter orange) flower extract	citrus junos flower oil
citrus aurantium amara (bitter orange) flower oil	citrus limon (lemon) flower water
citrus aurantium amara (bitter orange) flower water	citrus limon (lemon) leaf extract
citrus aurantium amara (bitter orange) flower wax	citrus limon (lemon) leaf cell extract
citrus aurantium bergamia (bergamot) leaf cell extract	citrus natsudaidai flower water
citrus aurantium bergamia (bergamot) leaf extract	citrus natsudaidai flower oil
citrus aurantium bergamia (bergamot) leaf oil	citrus reticulata (tangerine) leaf oil
citrus aurantium dulcis (orange) flower extract	citrus reticulata (tangerine) leaf water
citrus aurantium dulcis (orange) flower oil	citrus sinensis (orange) flower water
citrus aurantium dulcis (orange) flower wax	citrus tamurana flower extract
citrus aurantium dulcis (orange) flower	citrus unshiu flower extract
citrus aurantium dulcis (orange) leaf extract	citrus unshiu flower powder
citrus clementina leaf cell extract	citrus unshiu flower water
citrus depressa flower water	citrus unshiu leaf extract

The Panel has reviewed previously the safety of *Citrus*-derived peel oils and concluded that 14 *Citrus*-derived peel oil ingredients are safe for use in both rinse-off and leave-on cosmetic products when formulated to be non-sensitizing and non-irritating, provided that leave-on products do not contain more than 0.0015% (15 ppm) 5-methoxypsoralen (5-MOP).<sup>2</sup> The Panel is concurrently reviewing the safety of *Citrus* fruit-derived ingredients, *Citrus* peel-derived ingredients, and *Citrus* plant- and seed-derived ingredients,

Some of the *Citrus* flowers and leaves that are used to derive the ingredients described in this safety assessment are used as food. The U.S. Food and Drug Administration (FDA) determined that the use of some *Citrus* flowers and leaves as direct food substances is generally recognized as safe (GRAS). Additionally, essential oils, oleoresins (solvent-free), and natural extracts (including distillates) derived from some *Citrus* flowers and leaves are GRAS for their intended use in foods for human and animal consumption. Daily consumption of these GRAS foods would result in much larger systemic exposures than what is expected from use in cosmetic products, even if there was 100% absorption. Thus, the systemic toxicity potential of *Citrus* flower- and leaf-derived ingredients via oral exposure is not addressed further in this report. The primary focus of the safety assessment is the review of safety based on topical exposure.

The Cosmetic Ingredient Review (CIR) does not review ingredients that function only as fragrance ingredients because, as fragrances, the safety of these ingredients is evaluated by the Research Institute for Fragrance Materials (RIFM). Four of the *Citrus* flower- and leaf-derived ingredients in this report function only as fragrance ingredients, according to the *International Cosmetic Ingredient Dictionary and Handbook* (see Table 2).<sup>1</sup> However, according to personal communications with RIFM in March 2015, these ingredients were not included in their review process, thus CIR is reviewing the safety of these ingredients.

Botanicals such as *Citrus* ingredients are comprised of hundreds of constituents, some of which have the potential to cause toxic effects; for example, bergapten (aka 5-methoxypsoralen or 5-MOP) is a naturally-occurring phototoxic furanocoumarin (psoralen) in some *Citrus* ingredients. In this assessment, CIR is reviewing the potential toxicity of each *Citrus* flower- or leaf-derived ingredient as a whole, complex substance. Except for specific constituents of concern that the Panel has identified, CIR is not reviewing the potential toxicity of the individual constituents of the *Citrus* flowers and leaves from which the ingredients in this report are derived.

**Note:** In many of the published studies included in this assessment, the information provided is not sufficient to determine how well the substance being tested represents the cosmetic ingredient. In this safety assessment, if a substance tested in a study is not clearly a cosmetic ingredient, because of lack of information on the genus and species from which the substance was derived and/or the method of extraction used, the test substance will be referred to by a common name (e.g. bitter orange flower oil). If the substance is clearly a cosmetic ingredient, the International Nomenclature of Cosmetic Ingredients (INCI) name will be used (e.g. "citrus aurantium amara (bitter orange) flower oil"). Additionally, some inconsistencies were noted in both taxonomic and INCI naming conventions. For example, this report includes the sweet orange ingredient described as citrus aurantium dulcis (orange) in the *International Cosmetic Ingredient Dictionary and Handbook*.<sup>1</sup> In contrast, most of the published literature and the FDA Voluntary Cosmetic Registration Program (VCRP) refer to this ingredient as citrus sinensis (sweet orange). Another example of a naming inconsistency is citrus grandis

(grapefruit); *Citrus grandis* is generally considered a name for a pummelo, which may also be referred to as *Citrus maxima*. *Citrus paradisi* appears to be the more widely accepted nomenclature for grapefruit. The INCI Committee of the Personal Care Products Council (Council) is working to correct some of these inconsistencies. The genus and species names associated with the ingredient names designated by the INCI Committee are listed in Table 3.<sup>3</sup>

## **CHEMISTRY**

### **Definition and General Characterization**

The definitions and functions of the *Citrus* flower- and leaf-derived ingredients included in this report are provided in Table 1. The definition indicates what part(s) of the plant an ingredient is obtained from. In some cases, the definition provides insight on the method(s) of manufacture. Essential oils are the hydrophobic, liquid, volatile aroma compounds in the insoluble condensate fraction. The essential oils are typically small molecules, but their chemical structures can vary rather widely. (Fixed oils, on the other hand are hydrophobic, nonvolatile, fatty compounds from plants, animals or algae. These are primarily composed of glycerides, and to some extent, free fatty acids. Constituents of these *Citrus*-derived ingredients may include both oil types.) The volatile nature of essential oils makes them more likely to be useful as fragrances, but that does not necessitate that fragrance is their only function.

### **Physical and Chemical Properties**

No published physical and chemical properties on *Citrus* flower and leaf-derived ingredients were identified in a literature search for these ingredients and no unpublished data were submitted.

### **Method of Manufacturing**

Figure 1 is a generic representation of the method of manufacturing for citrus aurantium amara (bitter orange) flower wax. In the preparation of this ingredient, citrus aurantium amara flowers undergo extraction with a solvent to form a “concrete”, which is then dissolved in alcohol. The insoluble portion of this solution is the floral wax, which is then further refined.

### **Constituents/Composition**

The *Citrus* ingredients are complex botanicals made up of numerous constituents. Table 4 lists citrus constituents that are established contact allergens, according to the European Commission’s Scientific Committee on Consumer Safety (SCCS). Table 5 presents the cosmetic allergens certificate of analysis for citrus aurantium amara (bitter orange) flower wax.

In data provided by a supplier, citrus aurantium amara (bitter orange) flower wax had less than 0.1 mg/kg heavy metals (arsenic, cadmium, and lead) and no detectable pesticides (< 0.005 mg/kg) or polycyclic aromatic hydrocarbons (< 0.25 µg/kg).<sup>4</sup> Concentrations of aflatoxins (B1, B2, G1, G2) were less than 0.1 µg/kg, with the total aflatoxins concentration less than 0.4 µg/kg, and dioxins were less than 0.6 pg/g.

## **USE**

### **Cosmetic**

The safety of these cosmetic ingredients is evaluated on the basis of the expected use in cosmetics. The Panel utilizes data received from the FDA and the cosmetics industry in determining safety. The data received from the FDA are those it collects from manufacturers on the use of individual ingredients in cosmetics by cosmetic product category in its Voluntary Cosmetic Registration Program (VCRP), and those from the cosmetic industry are submitted in response to a survey of the maximum reported use concentrations by category conducted by the Personal Care Products Council (Council).

According to the 2015 VCRP data, citrus aurantium amara (bitter orange) flower oil has the most reported uses of the ingredients in this report in cosmetic products, with a total of 89; the majority of the uses are in leave-on skin care preparations (Table 6).<sup>5</sup> Citrus aurantium dulcis (orange) flower extract has the second greatest number of overall uses reported, with a total of 71; a majority of the uses are in rinse-off and leave-on skin care preparations. The results of the concentration of use survey conducted in 2013 by the Council indicate citrus aurantium amara (bitter orange) flower extract has the highest reported maximum concentration of use; it is used at up to 5% in face and neck products.<sup>6</sup> Citrus aurantium amara (bitter orange) flower water had the second highest reported maximum concentration of use; it is used at up to 4% in night skin care products.

Table 7 lists all *Citrus* flower- and leaf-derived ingredients not indicated to be in use based on the VCRP data or the results of the Council concentration of use survey. Currently, CIR is awaiting the results of a concentration of use survey for citrus aurantium bergamia (bergamot) leaf cell extract, citrus clementina leaf cell extract, citrus depressa flower water, citrus junos flower oil, citrus limon (lemon) flower water, citrus limon (lemon) leaf cell extract, citrus natsudaikai flower oil, citrus

sinensis (orange) flower water, citrus unshiu flower extract, citrus unshiu leaf extract: these ingredients have no reported uses in the VCRP database.

Some of these ingredients may be used in products that can be incidentally ingested or come into contact with mucous membranes. For example, citrus aurantium dulcis (orange) flower oil is used at 0.9% in lipstick and citrus aurantium dulcis (orange) flower extract is used at 0.2% in personal cleanliness products. Additionally, some of these ingredients were reported to be used in fragrance preparations and could possibly be inhaled. For example, citrus aurantium dulcis (orange) flower extract was reported to be used in cologne and toilet waters at a maximum concentration of 0.01%. 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 below  $10\ \mu\text{m}$  compared with pump sprays.<sup>7-10</sup> Therefore, most droplets/particles incidentally inhaled from cosmetic sprays would be deposited in the nasopharyngeal and bronchial regions and would not be respirable (i.e., they would not enter the lungs) to any appreciable amount.<sup>8,9</sup>

Under the rules governing cosmetic products in the European Union, *Citrus*-derived ingredients must have a furocoumarin content below 1 mg/kg in sun-protection products and in bronzing products.<sup>11</sup> The International Fragrance Association (IFRA) has issued standards for *Citrus* oils and other furocoumarin-containing essential oils.<sup>12</sup> Finished products that are applied to the skin, excluding rinse-off products like bath preparations and soaps, must not contain more than 0.0015% or 15 ppm 5-MOP. This equates to a level of 0.0075% or 75 ppm in a fragrance compound when used at 20% in a consumer product that is applied to the skin. If the level of 5-MOP has not been determined, limits specified for individual oils should be observed, and when such oils are used in combination with other phototoxic constituent containing ingredients, the potential for an additive effect should be considered and use levels should be reduced accordingly.

An IFRA standard also has been issued for 7-methoxycoumarin, which is prohibited for use in fragrance compounds.<sup>13</sup> Based on established maximum levels of this substance from commercially-available natural sources (like essential oils, extracts and absolutes), IFRA has determined that exposure to 7-methoxycoumarin from the use of these oils and extracts is acceptable if the level of 7-methoxycoumarin in the finished product does not exceed 100 ppm.

### **Non-Cosmetic**

The essential oils, oleoresins (solvent-free), and natural extractives (including distillates) derived from the following *Citrus* plant sources are generally recognized as safe (GRAS) for their intended use in foods for human consumption: *Citrus aurantifolia* (lime); *Citrus aurantium* (bergamot); *Citrus aurantium* (bitter orange; the flowers and peel); *Citrus limon* (lemon); *Citrus paradisi* (grapefruit); *Citrus reticulata* (tangerine); *Citrus reticulata blanco* (mandarin); *Citrus sinensis* (orange; the leaf, flowers, and peel) and citrus peels (species not specified) (21CFR182.20). These essential oils, oleoresins (solvent-free), and natural extractives (including distillates) of these *Citrus* plant sources are GRAS for their intended use in animal drugs, feeds, and related products (21CFR582.20).

### **TOXICOKINETICS**

No relevant published toxicokinetics studies on *Citrus* flower- and leaf-derived ingredients were identified in a literature search for these ingredients and no unpublished data were submitted; these types of data are not expected since these botanical ingredients are mixtures of hundreds of constituents.

### **TOXICOLOGICAL STUDIES**

#### **Acute Toxicity**

The some of the *Citrus* ingredients in this assessment are found in foods, and the daily exposure from food use would result in a much larger systemic dose than that resulting from use in cosmetic products. Also, as noted earlier, essential oils, oleoresins (solvent-free), and natural extractives (including distillates) derived from some *Citrus* flowers and leaves are GRAS for their intended use in foods for human and animal consumption according to the FDA. Consequently, the systemic toxicity potential is not addressed further in this report. The safety focus of use of these *Citrus* ingredients as cosmetic ingredients is on the potential for irritation and sensitization from topical exposure.

#### ***Dermal – Non-Human***

##### **Bitter Orange Leaf Oil**

The dermal LD<sub>50</sub> of bitter orange leaf oil (described as “petitgrain bigarade oil”) was reported as greater than 2 g/kg in rabbits; however, only 2 rabbits were used in the study.<sup>14</sup> An occlusive patch of undiluted test material was applied for 24 h.

#### **Repeated Dose Toxicity**

No relevant published repeated dose toxicity studies on *Citrus* flower- and leaf-derived ingredients were identified in a literature search for these ingredients and no unpublished data were submitted.

### **REPRODUCTIVE AND DEVELOPMENTAL TOXICITY**

No relevant published reproductive and developmental studies on *Citrus* flower- and leaf-derived ingredients were identified in a literature search for these ingredients and no unpublished data were submitted.

### **GENOTOXICITY**

No relevant published genotoxicity studies on *Citrus* flower- and leaf-derived ingredients were identified in a literature search for these ingredients and no unpublished data were submitted.

### **CARCINOGENICITY**

No relevant published carcinogenicity studies on *Citrus* flower- and leaf-derived ingredients were identified in a literature search for these ingredients and no unpublished data were submitted.

### **IRRITATION AND SENSITIZATION**

#### **Dermal Irritation**

Dermal irritation studies are summarized in Table 8.<sup>14-19</sup> In rabbit studies, moderate, reversible erythema reactions were observed with undiluted citrus aurantium amara (bitter orange) flower wax and slight erythema, after treated with unreported concentrations of bitter orange leaf oil (described as “petitgrain bigarade oil”). In human subjects, no irritation was observed after topical exposure to bitter orange leaf oil (described as “petitgrain bigarade oil”; up to 8%).

#### **Ocular Irritation**

##### **Citrus Aurantium Amara (Bitter Orange) Flower Wax**

The eye tolerance of citrus aurantium amara (bitter orange) flower wax (> 50%) was tested in vitro using the SIRC cell strain.<sup>20</sup> Tolerance was evaluated by measuring cytotoxicity. Negative controls solutions were physiological serum or sample diluent and the positive control solutions were 0.01% to 0.2% SDS. Negligible cytotoxicity was observed.

#### **Sensitization**

Sensitization studies are presented in Table 9.<sup>14,21</sup> Bitter orange leaf oil (described as “petitgrain bigarade oil”) at up to 8% was not sensitizing in human maximization tests.

#### **Phototoxicity and Photosensitization**

Phototoxicity and photosensitization studies are presented in Table 10.<sup>22</sup> Undiluted bitter orange leaf oil (described as “petitgrain bigarade oil”) was not photosensitizing in tests with hairless mice or miniature swine.

### **CLINICAL STUDIES**

No relevant published clinical studies on *Citrus* flower- and leaf-derived ingredients were identified in a literature search for these ingredients and no unpublished data were submitted.

### **SUMMARY**

The 32 *Citrus* flower- and leaf-derived ingredients described in this report function primarily as fragrances and/or skin conditioning agents. Botanicals such as *Citrus* are composed of hundreds of constituents, some of which have the potential to cause toxic effects; for example, bergapten (aka 5-methoxypsoralen or 5-MOP) is a naturally-occurring, phototoxic furanocoumarin (psoralen) in *Citrus*. CIR reviewed the information available on the potential toxicity of each *Citrus* flower- and leaf-derived ingredient as a whole, complex substance; CIR did not review the potential toxicity information on the individual constituents of which the *Citrus* flower- and leaf-derived ingredients are comprised.

Citrus aurantium amara (bitter orange) flower oil has the most reported uses of the ingredients in this report in cosmetic products, with a total of 89; the majority of the uses are in leave-on skin care preparations. Citrus aurantium dulcis (orange) flower extract has the second greatest number of overall uses reported, with a total of 71; a majority of the uses are in rinse-off and leave-on skin care preparations. The results of the concentration of use survey indicate citrus aurantium amara (bitter orange) flower extract has the highest reported maximum concentration of use; it is used at up to 5% in face and neck products. Citrus aurantium amara (bitter orange) flower water had the second highest reported maximum concentration of use; it is used at up to 4% in night skin care products.

Under the rules governing cosmetic products in the European Union, *Citrus*-derived ingredients must have a furocoumarin content below 1 mg/kg in sun-protection and bronzing products. IFRA also has issued standards for *Citrus* oils and other furocoumarin-containing essential oils. Finished products that are applied to the skin, excluding rinse-off products like bath preparations and soaps, must not contain more than 0.0015% or 15 ppm 5-MOP. If the level of 5-MOP has not been determined, limits specified for individual oils should be observed, and when such oils are used in combination with other phototoxic ingredients, the potential additive effect should be taken into consideration and use levels should be reduced accordingly.

Some of the *Citrus* ingredients in this assessment are found in foods, and the daily exposure from food use would result in a much larger systemic dose than that resulting from use in cosmetic products. Essential oils, oleoresins (solvent-free), and natural extractives (including distillates) derived from some citrus fruits are GRAS for their intended use in foods for human and animal consumption according to the FDA.

The dermal LD<sub>50</sub> of undiluted bitter orange leaf oil (described as “petitgrain bigarade oil”) was reported as greater than 2 g/kg when tested in 2 rabbits.

In rabbit studies, moderate, reversible erythema reactions were observed with undiluted citrus aurantium amara (bitter orange) flower wax and slight erythema, after treated with unreported concentrations of bitter orange leaf oil (described as “petitgrain bigarade oil”). In human subjects, no irritation was observed after topical exposure to bitter orange leaf oil (described as “petitgrain bigarade oil”; up to 8%).

Essentially no cytotoxicity was observed in an in vitro eye tolerance study of citrus aurantium amara (bitter orange) flower wax (> 50%) using the SIRC cell strain.

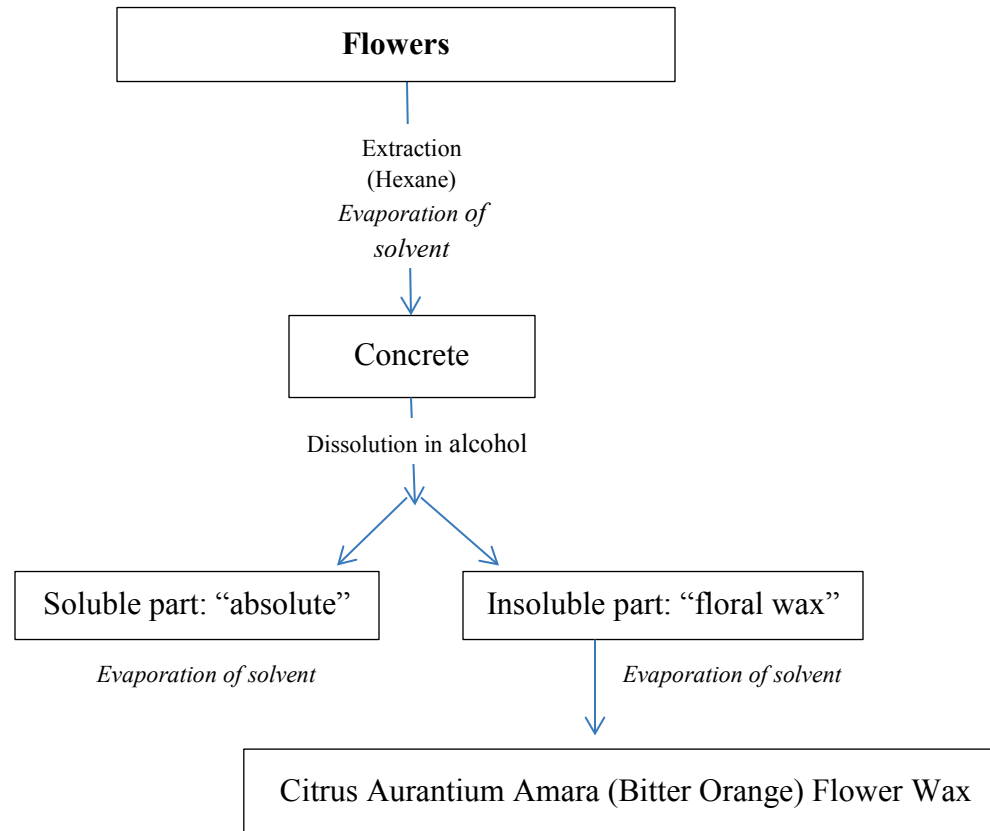
Bitter orange leaf oil (described as “petitgrain bigarade oil”) at up to 8% was not sensitizing in human maximization tests.

Undiluted bitter orange leaf oil (described as “petitgrain bigarade oil”) was not photosensitizing in tests with hairless mice or miniature swine.

No published studies on the physical and chemical properties, toxicokinetics, repeated dose toxicity, reproductive and development toxicity, genotoxicity, carcinogenicity, or clinical studies of *Citrus* flower- and leaf-derived ingredients were discovered and no unpublished data were submitted to address these topics.

**FIGURES**

**Figure 1.** Manufacturing flow chart of citrus aurantium amara (bitter orange) flower wax.<sup>23</sup>



**TABLES****Table 1.** Definitions and functions of Citrus-derived ingredients. <sup>24</sup>

<b>Ingredient</b>	<b>Definition</b>	<b>Function</b>
Citrus Aurantifolia (Lime) Flower Extract	Citrus Aurantifolia (Lime) Flower Extract is the extract of the flowers of <i>Citrus aurantifolia</i> .	Cosmetic Astringents; Skin-Conditioning Agents - Miscellaneous
Citrus Aurantifolia (Lime) Leaf Oil	Citrus Aurantifolia (Lime) Leaf Oil is the volatile oil obtained from the leaves of <i>Citrus aurantifolia</i> .	Fragrance Ingredients
Citrus Aurantium Amara (Bitter Orange) Flower Extract CAS No. 72968-50-4	Citrus Aurantium Amara (Bitter Orange) Flower Extract is the extract of the flowers of <i>Citrus aurantium amara</i> .	Skin-Conditioning Agents - Occlusive
Citrus Aurantium Amara (Bitter Orange) Flower Oil	Citrus Aurantium Amara (Bitter Orange) Flower Oil is the volatile oil obtained from the flowers of <i>Citrus aurantium amara</i> .	Fragrance Ingredients; Skin-Conditioning Agents - Miscellaneous
Citrus Aurantium Amara (Bitter Orange) Flower Water	Citrus Aurantium Amara (Bitter Orange) Flower Water is an aqueous solution of the steam distillate obtained from the flowers of <i>Citrus aurantium amara</i> .	Fragrance Ingredients; Skin-Conditioning Agents - Miscellaneous
Citrus Aurantium Amara (Bitter Orange) Flower Wax	Citrus Aurantium Amara (Bitter Orange) Flower Wax is a wax obtained from the flower of <i>Citrus aurantium amara</i> .	Not reported
Citrus Aurantium Bergamia (Bergamot) Leaf Cell Extract	Citrus Aurantium Bergamia (Bergamot) Leaf Cell Extract is the extract of a culture of the leaf cells of <i>Citrus aurantium bergamia</i> . The accepted scientific name for <i>Citrus aurantium bergamia</i> is <i>Citrus x limon</i> .	Antioxidants; Skin Protectants
Citrus Aurantium Bergamia (Bergamot) Leaf Extract	Citrus Aurantium Bergamia (Bergamot) Leaf Extract is the extract of the leaves of <i>Citrus aurantium bergamia</i> .	Cosmetic Astringents
Citrus Aurantium Bergamia (Bergamot) Leaf Oil	Citrus Aurantium Bergamia (Bergamot) Leaf Oil is the volatile oil obtained from the leaves of <i>Citrus aurantium bergamia</i> .	Cosmetic Astringents
Citrus Aurantium Dulcis (Orange) Flower	Citrus Aurantium Dulcis (Orange) Flower is the flower of <i>Citrus aurantium dulcis</i> .	Skin-Conditioning Agents - Miscellaneous
Citrus Aurantium Dulcis (Orange) Flower Extract	Citrus Aurantium Dulcis (Orange) Flower Extract is the extract of the flowers of <i>Citrus aurantium dulcis</i> .	Skin-Conditioning Agents - Miscellaneous
Citrus Aurantium Dulcis (Orange) Flower Oil CAS No. 8016-38-4	Citrus Aurantium Dulcis (Orange) Flower Oil is the volatile oil obtained from the flowers of <i>Citrus aurantium dulcis</i> .	Fragrance Ingredients; Skin-Conditioning Agents - Miscellaneous
Citrus Aurantium Dulcis (Orange) Flower Wax	Citrus Aurantium Dulcis (Orange) Flower Wax is a wax obtained from the flowers of <i>Citrus aurantium dulcis</i> .	Skin-Conditioning Agents - Occlusive
Citrus Aurantium Dulcis (Orange) Leaf Extract	Citrus Aurantium Dulcis (Orange) Leaf Extract is the extract of the leaves of <i>Citrus aurantium dulcis</i> .	Skin-Conditioning Agents - Miscellaneous
Citrus Clementina Leaf Cell Extract	Citrus Clementina Leaf Cell Extract is the extract of a culture of the leaf cells of <i>Citrus clementina</i> . The accepted scientific name for <i>Citrus clementina</i> is <i>Citrus x aurantium</i> .	Antioxidants; Skin Protectants
Citrus Depressa Flower Water	Citrus Depressa Flower Water is the aqueous solution of the steam distillates obtained from the flowers of <i>Citrus depressa</i> . The accepted scientific name for <i>Citrus depressa</i> is <i>Citrus reticulata</i> .	Skin-Conditioning Agents - Humectant
Citrus Junos Flower Oil	Citrus Junos Flower Oil is the volatile oil obtained from the flowers of <i>Citrus junos</i> . The accepted scientific name for <i>Citrus junos</i> is <i>Citrus x junos</i> .	Flavoring Agents; Fragrance Ingredients
Citrus Limon (Lemon) Flower Water	Citrus Limon (Lemon) Flower Water is an aqueous solution of the steam distillates obtained from the flowers of <i>Citrus limon</i> (lemon). The accepted scientific name for <i>Citrus limon</i> is <i>Citrus x limon</i> .	Skin-Conditioning Agents - Humectant
Citrus Grandis (Grapefruit) Leaf Extract	Citrus Grandis (Grapefruit) Leaf Extract is the extract of the leaves of <i>Citrus grandis</i> .	Skin-Conditioning Agents - Miscellaneous
Citrus Hystrix Leaf Extract	Citrus Hystrix Leaf Extract is the extract of the leaves of <i>Citrus hystrix</i> .	Skin-Conditioning Agents - Miscellaneous
Citrus Limon (Lemon) Leaf Cell Extract CAS No. 84929-31-7	Citrus Limon (Lemon) Leaf Cell Extract is the extract of a culture of the leaf cells of <i>Citrus limon</i> . The accepted scientific name for <i>Citrus limon</i> is <i>Citrus x limon</i> .	Skin-Conditioning Agents - Miscellaneous
Citrus Limon (Lemon) Leaf Extract	Citrus Limon (Lemon) Leaf Extract is the extract of the leaves of <i>Citrus limon</i> .	Antioxidants
Citrus Natsudaïdai Flower Oil	Citrus Natsudaïdai Flower Oil is the volatile oil obtained from the flowers of <i>Citrus natsudaïdai</i> . The accepted scientific name for <i>Citrus natsudaïdai</i> is <i>Citrus x aurantium</i> .	Fragrance Ingredients
Citrus Natsudaïdai Flower Water	Citrus Natsudaïdai Flower Water is the aqueous solution of the steam distillates obtained from the flowers of <i>Citrus natsudaïdai</i> .	Fragrance Ingredients
Citrus Reticulata (Tangerine) Leaf Oil CAS No. 8014-17-3	Citrus Reticulata (Tangerine) Leaf Oil is the volatile oil derived from the leaves of <i>Citrus reticulata</i>	Fragrance Ingredients; Skin-Conditioning Agents - Miscellaneous
Citrus Reticulata (Tangerine) Leaf Water	Citrus Reticulata (Tangerine) Leaf Water is an aqueous solution of the steam distillate obtained from the leaves of <i>Citrus reticulata</i> .	Skin-Conditioning Agents - Miscellaneous

**Table 1.** Definitions and functions of Citrus-derived ingredients. <sup>24</sup>

<b>Ingredient</b>	<b>Definition</b>	<b>Function</b>
Citrus Sinensis (Orange) Flower Water	Citrus Sinensis (Orange) Flower Water is an aqueous solution of the steam distillates obtained from the flowers of <i>Citrus sinensis</i> . The accepted scientific name for <i>Citrus sinensis</i> is <i>Citrus x aurantium</i> .	Skin-Conditioning Agents - Humectant
Citrus Tamurana Flower Extract	Citrus Tamurana Flower Extract is the extract of the flowers of <i>Citrus tamurana</i> .	Skin-Conditioning Agents - Miscellaneous
Citrus Unshiu Flower Extract	Citrus Unshiu Flower Extract is the extract of the flowers of <i>Citrus unshiu</i> . The accepted scientific name for <i>Citrus unshiu</i> is <i>Citrus reticulata</i> .	Skin Protectants; Skin-Conditioning Agents - Humectant
Citrus Unshiu Flower Powder	Citrus Unshiu Flower Powder is the powder obtained from the dried, ground flowers of <i>Citrus unshiu</i> .	Exfoliants
Citrus Unshiu Flower Water	Citrus Unshiu Flower Water is an aqueous solution of the steam distillates obtained from the flowers of <i>Citrus unshiu</i> .	Fragrance Ingredients
Citrus Unshiu Leaf Extract	Citrus Unshiu Leaf Extract is the extract of the leaves of <i>Citrus unshiu</i> . The accepted scientific name for <i>Citrus unshiu</i> is <i>Citrus reticulata</i> .	Skin Protectants; Skin-Conditioning Agents - Humectant

**Table 2.** Citrus-ingredients that potentially function solely as fragrance ingredients.

Citrus Aurantifolia (Lime) Leaf Oil  
Citrus Natsudaikai Flower Oil  
Citrus Natsudaikai Flower Water  
Citrus Unshiu Flower Water

**Table 3.** Review of *Citrus* genus species names<sup>3</sup>

<b>Genus Species Name Used in INCI Names (common name)</b>	<b>Accepted Genus Species Name</b>
<i>Citrus aurantifolia</i> (lime)	<i>Citrus x aurantifolia</i>
<i>Citrus aurantium amara</i> (bitter orange)	<i>Citrus x aurantium</i>
<i>Citrus aurantium bergamia</i> (bergamot)	<i>Citrus x limon</i>
<i>Citrus aurantium dulcis</i> (orange)	<i>Citrus x aurantium</i>
<i>Citrus clementina</i> (clementine)	<i>Citrus x aurantium</i>
<i>Citrus depressa</i>	<i>Citrus reticulata</i>
<i>Citrus glauca</i>	<i>Citrus glauca</i>
<i>Citrus grandis</i> (grapefruit or pomelo)	<i>Citrus maxima</i> or <i>Citrus x aurantium</i>
<i>Citrus hassaku</i>	<i>Citrus medica x Citrus x aurantium</i>
<i>Citrus iyo</i>	<i>Citrus x aurantium</i>
<i>Citrus jabara</i>	Not known
<i>Citrus japonica</i> (kumquat)	<i>Citrus japonica</i>
<i>Citrus junos</i>	<i>Citrus x junos</i>
<i>Citrus limon</i> (lemon)	<i>Citrus x limon</i>
<i>Citrus madurensis</i>	<i>Citrus x microcarpa</i>
<i>Citrus medica vulgaris</i>	<i>Citrus reticulata</i>
<i>Citrus natsudaikai</i>	<i>Citrus x aurantium</i>
<i>Citrus nobilis</i> (mandarin orange)	<i>Citrus reticulata</i>
<i>Citrus paradisi</i> (grapefruit)	<i>Citrus x aurantium</i>
<i>Citrus reticulata</i> (tangerine)	<i>Citrus reticulata</i>
<i>Citrus shunkokan</i>	Cultivated hybrid
<i>Citrus sinensis</i> (orange)	<i>Citrus x aurantium</i>
<i>Citrus sphaerocarpa</i>	Cultivated hybrid
<i>Citrus sudachi</i>	<i>Citrus reticulata</i>
<i>Citrus tachibana</i>	Not listed
<i>Citrus tamurana</i>	Cultivated hybrid
<i>Citrus tangelo</i> (tangelo)	<i>Citrus x aurantium</i>
<i>Citrus tangerine</i> (tangerine)	<i>Citrus reticulata</i>
<i>Citrus tankan</i>	<i>Citrus reticulata</i>
<i>Citrus unshiu</i>	<i>Citrus reticulata</i>



**Table 4.** Potential constituents that are established contact allergens in humans, according to the SCCS

<b>Constituent</b>	<b>categorized according to number of patients reacting positively and to the number of patients tested (&gt;1000 patients tested, unless indicated as r.t., i.e., rarely tested)<sup>25</sup></b>
$\beta$ -caryophyllene	$\leq 10$ (oxidized and non-oxidized)
carvone	$\leq 10$ (r.t.)
citral	101 to 1000
citronellol	11-100
coumarin	101 to 1000
farnesol	101 to 1000
geraniol	101 to 1000
linalyl acetate	$\leq 10$
$\alpha$ - and $\beta$ -pinene	11-100
(DL)-limonene	11-100 (non-oxidized); 101 to 1000 (oxidized)
terpineol (mixture of isomers)/ $\alpha$ -terpineol	$\leq 10$
terpinolene	11-100

**Table 5.** Cosmetic allergens certificate from a manufacturer of citrus aurantium amara (bitter orange) flower wax<sup>26</sup>

<b>Allergen</b>	<b>Amount</b>
Amyl cinnamal	< 5 ppm
Benzyl alcohol	< 20 ppm
Cinnamyl alcohol	< 1 ppm
Citral	< 10 ppm
Eugenol	< 5 ppm
Hydroxycitronellal	< 5 ppm
Isoeugenol	< 5 ppm
Amylcinnamyl alcohol	< 1 ppm
Benzyl salicylate	< 5 ppm
Cinnamal	< 5 ppm
Coumarin	< 15 ppm
Geraniol	< 5 ppm
Hydroxyisohexyl 3-cyclo hexane carboxaldehyde	< 5 ppm
Anise alcohol	< 30 ppm
Benzyl cinnamate	< 15 ppm
Farnesol	< 50 ppm
Butylphenyl methylpropional	< 1 ppm
Linalool	< 50 ppm
Benyl benzoate	< 5 ppm
Citronellol	< 5 ppm
Hexyl cinnamal	< 1 ppm
Limonene	< 200 ppm
Methyl 2-octynoate	< 1 ppm
Alpha-isomethyl ionone	< 1 ppm
Evernia prunastri	ND
Evernia furfuracea	ND
Detection limit 2 ppm.	
ND = unable to be detected by GCSM	



**Table 6.** Frequency (2015) and concentration of use (2013) according to duration and type of exposure for *Citrus* flower- and leaf-derived ingredients.<sup>5,6</sup>

	<i># of Uses</i>	<i>Max Conc of Use (%)</i>	<i># of Uses</i>	<i>Max Conc of Use (%)</i>	<i># of Uses</i>	<i>Max Conc of Use (%)</i>	<i># of Uses</i>	<i>Max Conc of Use (%)</i>
	<b>Citrus Aurantium Dulcis (Orange) Leaf Extract</b>		<b>Citrus Reticulata (Tangerine) Leaf Oil<sup>h</sup></b>		<b>Kaffir Lime (Citrus Hystrix) Leaf Oil<sup>i</sup></b>			
<b>Totals<sup>†</sup></b>	<b>1</b>	<b>NR</b>	<b>33</b>	<b>NR</b>	<b>26</b>	<b>NR</b>		
<b><i>Duration of Use</i></b>								
Leave-On	1	NR	18	NR	12	NR		
Rinse Off	NR	NR	10	NR	12	NR		
Diluted for (Bath) Use	NR	NR	5	NR	2	NR		
<b><i>Exposure Type</i></b>								
Eye Area	NR	NR	NR	NR	NR	NR		
Incidental Ingestion	NR	NR	1	NR	NR	NR		
Incidental Inhalation-Spray	1 <sup>b</sup>	NR	3; 5 <sup>b</sup> ; 5 <sup>c</sup>	NR	2; 3 <sup>b</sup> ; 1 <sup>c</sup>	NR		
Incidental Inhalation-Powder	NR	NR	5 <sup>c</sup>	NR	1 <sup>c</sup>	NR		
Dermal Contact	1	NR	29	NR	21	NR		
Deodorant (underarm)	NR	NR	NR	NR	NR	NR		
Hair - Non-Coloring	NR	NR	3	NR	5	NR		
Hair-Coloring	NR	NR	NR	NR	NR	NR		
Nail	NR	NR	NR	NR	NR	NR		
Mucous Membrane	NR	NR	11	NR	9	NR		
Baby Products	NR	NR	1	NR	NR	NR		

NR = Not reported.

† 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.

<sup>a</sup> It is possible these products may be powders, but it is not specified whether the reported uses are powders.<sup>b</sup> It is possible these products may be sprays, but it is not specified whether the reported uses are sprays.<sup>c</sup> Not specified whether a powder or a spray, so this information is captured for both categories of incidental inhalation.<sup>d</sup> Listed as Citrus Aurantium (Bitter Orange) in the VCRP database.<sup>e</sup> Listed as Citrus Bergamia (Bergamot Orange) in the VCRP database.<sup>f</sup> Includes two uses listed under Citrus Sinensis (Sweet Orange) Flower Extract in the VCRP database.<sup>g</sup> Listed as Citrus Sinensis (Sweet Orange) Flower Oil in the VCRP database.<sup>h</sup> Includes one use listed under Citrus Reticulata (Mandarin Orange) Leaf Oil in the VCRP database.<sup>i</sup> Only listed in the VCRP database, not an INCI ingredient. Included because of similarity.

**Table 7.** Ingredients that are not reported to be in use

Citrus Aurantifolia (Lime) Leaf Oil  
Citrus Aurantium Bergamia (Bergamot) Leaf Extract  
Citrus Aurantium Dulcis (Orange) Flower  
Citrus Aurantium Dulcis (Orange) Flower Wax  
Citrus Grandis (Grapefruit) Leaf Extract  
Citrus Hystrix Leaf Extract  
Citrus Limon (Lemon) Leaf Extract  
Citrus Natsudaidai Flower Water  
Citrus Reticulata (Tangerine) Leaf Water  
Citrus Tamurana Flower Extract  
Citrus Unshiu Flower Powder  
Citrus Unshiu Flower Water

**Table 8.** Dermal irritation studies for Citrus-derived ingredients

<b>Test Article</b>	<b>Concentration/Dose</b>	<b>Test Population</b>	<b>Procedure</b>	<b>Results</b>	<b>Reference</b>
<b>NON-HUMAN</b>					
Citrus Aurantium Amara (Bitter Orange) Flower Wax	neat	6 New Zealand male rabbits	primary cutaneous tolerance test ; test material applied to scarified and intact shaved skin with 2.5 cm <sup>2</sup> occluded patches for 24 h	moderate irritation reactions (erythema) that were totally reversible by 72 h; reactions were accompanied by minor, isolated structural modifications	<sup>17</sup>
bitter orange leaf oil (described as "petitgrain bigarade oil")	2g/kg	2 rabbits	24-h occlusive, single dose study	slight erythema	<sup>14</sup>
<b>HUMAN</b>					
bitter orange leaf oil (described as "petitgrain bigarade oil")	0.1%, 2% or 5%; multiple vehicles	48 subjects at 0.1%, 30 subjects at 2%, and 30 subjects at 5%	24-72 h occlusive patch tests	no irritation	<sup>19</sup>
bitter orange leaf oil (described as "petitgrain bigarade oil")	8%, vehicle not specified	25 subjects	48 h occlusive patch applied to the forearm or back	no irritation	<sup>14</sup>

**Table 9.** Sensitization studies for Citrus-derived ingredients

<b>Test Article</b>	<b>Concentration/Dose</b>	<b>Test Population</b>	<b>Procedure</b>	<b>Results</b>	<b>Reference</b>
<b>HUMAN</b>					
bitter orange leaf oil (described as "petitgrain bigarade oil")	2% in paraffin	200 patients with dermatitis tested with 35 essential oils plus an additional 50 patients with balsam sensitivity	sensitization patch study, details not provided	3 positive reactions, details not provided	<sup>21</sup>
bitter orange leaf oil (described as "petitgrain bigarade oil")	8% in petrolatum	25 subjects	maximization study, details not provided	not sensitizing	<sup>14</sup>

**Table 10.** Photosensitization and phototoxicity studies

<b>Test Article</b>	<b>Concentration/Dose</b>	<b>Test Population</b>	<b>Procedure</b>	<b>Results</b>	<b>Reference</b>
<b>NON-HUMAN</b>					
bitter orange leaf oil (described as "petitgrain bigarade oil")	undiluted	hairless mice (#/group not stated)	test material was applied, and the test sites were irradiated with UVA irradiation by blacklight or xenon lamp	not photosensitizing	22
bitter orange leaf oil (described as "petitgrain bigarade oil")	undiluted	miniature swine (#/group not stated)	test material was applied, and the test sites were irradiated with UVA irradiation by blacklight or xenon lamp	not photosensitizing	22

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**2015 FDA VCRP RAW DATA**

977104418	CITRUS AURANTIFOLIA (LIME) FLOWER EXTRACT	05F - Shampoos (non-coloring)	1
977104418	CITRUS AURANTIFOLIA (LIME) FLOWER EXTRACT	10A - Bath Soaps and Detergents	1
977169291	CITRUS AURANTIUM (BITTER ORANGE) FLOWER EXTRACT	03D - Eye Lotion	5
977169291	CITRUS AURANTIUM (BITTER ORANGE) FLOWER EXTRACT	03G - Other Eye Makeup Preparations	1
977169291	CITRUS AURANTIUM (BITTER ORANGE) FLOWER EXTRACT	04A - Cologne and Toilet waters	1
977169291	CITRUS AURANTIUM (BITTER ORANGE) FLOWER EXTRACT	05F - Shampoos (non-coloring)	1
977169291	CITRUS AURANTIUM (BITTER ORANGE) FLOWER EXTRACT	08F - Nail Polish and Enamel Removers	1
977169291	CITRUS AURANTIUM (BITTER ORANGE) FLOWER EXTRACT	10A - Bath Soaps and Detergents	2
977169291	CITRUS AURANTIUM (BITTER ORANGE) FLOWER EXTRACT	10E - Other Personal Cleanliness Products	1
977169291	CITRUS AURANTIUM (BITTER ORANGE) FLOWER EXTRACT	12A - Cleansing	3
977169291	CITRUS AURANTIUM (BITTER ORANGE) FLOWER EXTRACT	12C - Face and Neck (exc shave)	9
977169291	CITRUS AURANTIUM (BITTER ORANGE) FLOWER EXTRACT	12D - Body and Hand (exc shave)	8
977169291	CITRUS AURANTIUM (BITTER ORANGE) FLOWER EXTRACT	12F - Moisturizing	3
977169291	CITRUS AURANTIUM (BITTER ORANGE) FLOWER EXTRACT	12G - Night	3
977169291	CITRUS AURANTIUM (BITTER ORANGE) FLOWER EXTRACT	12H - Paste Masks (mud packs)	1
977169291	CITRUS AURANTIUM (BITTER ORANGE) FLOWER EXTRACT	12J - Other Skin Care Preps	4
999001143	CITRUS AURANTIUM (BITTER ORANGE) FLOWER OIL	02A - Bath Oils, Tablets, and Salts	3
999001143	CITRUS AURANTIUM (BITTER ORANGE) FLOWER OIL	03G - Other Eye Makeup Preparations	4
999001143	CITRUS AURANTIUM (BITTER ORANGE) FLOWER OIL	04A - Cologne and Toilet waters	1
999001143	CITRUS AURANTIUM (BITTER ORANGE) FLOWER OIL	05G - Tonics, Dressings, and Other Hair Grooming Aids	1
999001143	CITRUS AURANTIUM (BITTER ORANGE) FLOWER OIL	05I - Other Hair Preparations	1
999001143	CITRUS AURANTIUM (BITTER ORANGE) FLOWER OIL	07I - Other Makeup Preparations	2

999001143	CITRUS AURANTIUM (BITTER ORANGE) FLOWER OIL	10A - Bath Soaps and Detergents	3
999001143	CITRUS AURANTIUM (BITTER ORANGE) FLOWER OIL	10E - Other Personal Cleanliness Products	2
999001143	CITRUS AURANTIUM (BITTER ORANGE) FLOWER OIL	11D - Preshave Lotions (all types)	1
999001143	CITRUS AURANTIUM (BITTER ORANGE) FLOWER OIL	11E - Shaving Cream	1
999001143	CITRUS AURANTIUM (BITTER ORANGE) FLOWER OIL	12A - Cleansing	3
999001143	CITRUS AURANTIUM (BITTER ORANGE) FLOWER OIL	12C - Face and Neck (exc shave)	22
999001143	CITRUS AURANTIUM (BITTER ORANGE) FLOWER OIL	12D - Body and Hand (exc shave)	8
999001143	CITRUS AURANTIUM (BITTER ORANGE) FLOWER OIL	12F - Moisturizing	15
999001143	CITRUS AURANTIUM (BITTER ORANGE) FLOWER OIL	12G - Night	7
999001143	CITRUS AURANTIUM (BITTER ORANGE) FLOWER OIL	12H - Paste Masks (mud packs)	2
999001143	CITRUS AURANTIUM (BITTER ORANGE) FLOWER OIL	12I - Skin Fresheners	1
999001143	CITRUS AURANTIUM (BITTER ORANGE) FLOWER OIL	12J - Other Skin Care Preps	6
999001143	CITRUS AURANTIUM (BITTER ORANGE) FLOWER OIL	13A - Suntan Gels, Creams, and Liquids	1
999001143	CITRUS AURANTIUM (BITTER ORANGE) FLOWER OIL	13B - Indoor Tanning Preparations	5
999001396	CITRUS AURANTIUM (BITTER ORANGE) FLOWER WATER	03D - Eye Lotion	2
999001396	CITRUS AURANTIUM (BITTER ORANGE) FLOWER WATER	03E - Eye Makeup Remover	1
999001396	CITRUS AURANTIUM (BITTER ORANGE) FLOWER WATER	03G - Other Eye Makeup Preparations	3
999001396	CITRUS AURANTIUM (BITTER ORANGE) FLOWER WATER	04A - Cologne and Toilet waters	1
999001396	CITRUS AURANTIUM (BITTER ORANGE) FLOWER WATER	10E - Other Personal Cleanliness Products	1
999001396	CITRUS AURANTIUM (BITTER ORANGE) FLOWER WATER	12A - Cleansing	7
999001396	CITRUS AURANTIUM (BITTER ORANGE) FLOWER WATER	12C - Face and Neck (exc shave)	2
999001396	CITRUS AURANTIUM (BITTER ORANGE) FLOWER WATER	12F - Moisturizing	4
999001396	CITRUS AURANTIUM (BITTER ORANGE) FLOWER WATER	12G - Night	3


999001396	CITRUS AURANTIUM (BITTER ORANGE) FLOWER WATER	12I - Skin Fresheners	3
999001396	CITRUS AURANTIUM (BITTER ORANGE) FLOWER WATER	12J - Other Skin Care Preps	1
999002194	CITRUS AURANTIUM AMARA (BITTER ORANGE) FLOWER WAX	12D - Body and Hand (exc shave)	1
999002194	CITRUS AURANTIUM AMARA (BITTER ORANGE) FLOWER WAX	12F - Moisturizing	1
999002194	CITRUS AURANTIUM AMARA (BITTER ORANGE) FLOWER WAX	12J - Other Skin Care Preps	1
977027487	CITRUS AURANTIUM DULCIS (ORANGE) FLOWER EXTRACT	02B - Bubble Baths	1
977027487	CITRUS AURANTIUM DULCIS (ORANGE) FLOWER EXTRACT	04A - Cologne and Toilet waters	2
977027487	CITRUS AURANTIUM DULCIS (ORANGE) FLOWER EXTRACT	05A - Hair Conditioner	1
977027487	CITRUS AURANTIUM DULCIS (ORANGE) FLOWER EXTRACT	05F - Shampoos (non-coloring)	1
977027487	CITRUS AURANTIUM DULCIS (ORANGE) FLOWER EXTRACT	07C - Foundations	2
977027487	CITRUS AURANTIUM DULCIS (ORANGE) FLOWER EXTRACT	07F - Makeup Bases	1
977027487	CITRUS AURANTIUM DULCIS (ORANGE) FLOWER EXTRACT	10A - Bath Soaps and Detergents	6
977027487	CITRUS AURANTIUM DULCIS (ORANGE) FLOWER EXTRACT	10E - Other Personal Cleanliness Products	7
977027487	CITRUS AURANTIUM DULCIS (ORANGE) FLOWER EXTRACT	12A - Cleansing	11
977027487	CITRUS AURANTIUM DULCIS (ORANGE) FLOWER EXTRACT	12B - Depilatories	6
977027487	CITRUS AURANTIUM DULCIS (ORANGE) FLOWER EXTRACT	12C - Face and Neck (exc shave)	4
977027487	CITRUS AURANTIUM DULCIS (ORANGE) FLOWER EXTRACT	12D - Body and Hand (exc shave)	4
977027487	CITRUS AURANTIUM DULCIS (ORANGE) FLOWER EXTRACT	12F - Moisturizing	13
977027487	CITRUS AURANTIUM DULCIS (ORANGE) FLOWER EXTRACT	12G - Night	4
977027487	CITRUS AURANTIUM DULCIS (ORANGE) FLOWER EXTRACT	12H - Paste Masks (mud packs)	3
977027487	CITRUS AURANTIUM DULCIS (ORANGE) FLOWER EXTRACT	12I - Skin Fresheners	1
977027487	CITRUS AURANTIUM DULCIS (ORANGE) FLOWER EXTRACT	12J - Other Skin Care Preps	2

999002862	CITRUS AURANTIUM DULCIS (ORANGE) LEAF EXTRACT	12G - Night	1
999004147	CITRUS BERGAMIA (BERGAMOT ORANGE) LEAF OIL	12C - Face and Neck (exc shave)	1
999004312	CITRUS RETICULATA (MANDARIN ORANGE) LEAF OIL	12D - Body and Hand (exc shave)	1
8014173	CITRUS RETICULATA (TANGERINE) LEAF OIL	01C - Other Baby Products	1
8014173	CITRUS RETICULATA (TANGERINE) LEAF OIL	02A - Bath Oils, Tablets, and Salts	3
8014173	CITRUS RETICULATA (TANGERINE) LEAF OIL	02B - Bubble Baths	1
8014173	CITRUS RETICULATA (TANGERINE) LEAF OIL	02D - Other Bath Preparations	1
8014173	CITRUS RETICULATA (TANGERINE) LEAF OIL	04E - Other Fragrance Preparation	3
8014173	CITRUS RETICULATA (TANGERINE) LEAF OIL	05A - Hair Conditioner	1
8014173	CITRUS RETICULATA (TANGERINE) LEAF OIL	05F - Shampoos (non-coloring)	2
8014173	CITRUS RETICULATA (TANGERINE) LEAF OIL	07E - Lipstick	1
8014173	CITRUS RETICULATA (TANGERINE) LEAF OIL	10A - Bath Soaps and Detergents	3
8014173	CITRUS RETICULATA (TANGERINE) LEAF OIL	10E - Other Personal Cleanliness Products	2
8014173	CITRUS RETICULATA (TANGERINE) LEAF OIL	12A - Cleansing	2
8014173	CITRUS RETICULATA (TANGERINE) LEAF OIL	12D - Body and Hand (exc shave)	5
8014173	CITRUS RETICULATA (TANGERINE) LEAF OIL	12F - Moisturizing	1
8014173	CITRUS RETICULATA (TANGERINE) LEAF OIL	12G - Night	2
8014173	CITRUS RETICULATA (TANGERINE) LEAF OIL	12J - Other Skin Care Preps	3
8014173	CITRUS RETICULATA (TANGERINE) LEAF OIL	13A - Suntan Gels, Creams, and Liquids	1
999004294	CITRUS SINENSIS (SWEET ORANGE) FLOWER EXTRACT	12D - Body and Hand (exc shave)	1
999004294	CITRUS SINENSIS (SWEET ORANGE) FLOWER EXTRACT	12F - Moisturizing	1

999003920	CITRUS SINENSIS (SWEET ORANGE) FLOWER OIL	05A - Hair Conditioner	1
999003920	CITRUS SINENSIS (SWEET ORANGE) FLOWER OIL	05F - Shampoos (non-coloring)	1
999003920	CITRUS SINENSIS (SWEET ORANGE) FLOWER OIL	10A - Bath Soaps and Detergents	1
999003920	CITRUS SINENSIS (SWEET ORANGE) FLOWER OIL	12C - Face and Neck (exc shave)	1
999003920	CITRUS SINENSIS (SWEET ORANGE) FLOWER OIL	12D - Body and Hand (exc shave)	1
999001307	KAFFIR LIME (CITRUS HYSTRIX) LEAF OIL	02A - Bath Oils, Tablets, and Salts	1
999001307	KAFFIR LIME (CITRUS HYSTRIX) LEAF OIL	02D - Other Bath Preparations	1
999001307	KAFFIR LIME (CITRUS HYSTRIX) LEAF OIL	04A - Cologne and Toilet waters	1
999001307	KAFFIR LIME (CITRUS HYSTRIX) LEAF OIL	04E - Other Fragrance Preparation	1
999001307	KAFFIR LIME (CITRUS HYSTRIX) LEAF OIL	05A - Hair Conditioner	2
999001307	KAFFIR LIME (CITRUS HYSTRIX) LEAF OIL	05F - Shampoos (non-coloring)	3
999001307	KAFFIR LIME (CITRUS HYSTRIX) LEAF OIL	10A - Bath Soaps and Detergents	7
999001307	KAFFIR LIME (CITRUS HYSTRIX) LEAF OIL	12D - Body and Hand (exc shave)	1
999001307	KAFFIR LIME (CITRUS HYSTRIX) LEAF OIL	12F - Moisturizing	3
999001307	KAFFIR LIME (CITRUS HYSTRIX) LEAF OIL	12J - Other Skin Care Preps	6



**TO:** Lillian Gill, Ph.D.  
Director - COSMETIC INGREDIENT REVIEW (CIR)

**FROM:** Halyna Breslawec, Ph.D.  
Industry Liaison to the CIR Expert Panel 

**DATE:** July 25, 2013

**SUBJECT:** Concentration of Use by FDA Product Category: Citrus-Derived Ingredients

**Concentration of Use by FDA Product Category - Citrus-Derived Ingredients\***

Citrus Aurantifolia (Lime)/Citrus Limon (Lemon) Fruit Water	Citrus Aurantium Dulcis (Orange) Flower Extract
Citrus Aurantifolia (Lime) Flower Extract	Citrus Aurantium Dulcis (Orange) Flower/Leaf/Stem Powder
Citrus Aurantifolia (Lime) Fruit	Citrus Aurantium Dulcis (Orange) Flower Oil
Citrus Aurantifolia (Lime) Fruit Extract	Citrus Aurantium Dulcis (Orange) Flower Water
Citrus Aurantifolia (Lime) Fruit Water	Citrus Aurantium Dulcis (Orange) Flower Wax
Citrus Aurantifolia (Lime) Juice	Citrus Aurantium Dulcis (Orange) Fruit Extract
Citrus Aurantifolia (Lime) Leaf Oil	Citrus Aurantium Dulcis (Orange) Fruit Powder
Citrus Aurantifolia (Lime) Oil	Citrus Aurantium Dulcis (Orange) Fruit Water
Citrus Aurantifolia (Lime) Peel	Citrus Aurantium Dulcis (Orange) Juice
Citrus Aurantifolia (Lime) Peel Extract	Citrus Aurantium Dulcis (Orange) Leaf Extract
Citrus Aurantifolia (Lime) Peel Oil	Citrus Aurantium Dulcis (Orange) Oil
Citrus Aurantifolia (Lime) Peel Powder	Citrus Aurantium Dulcis (Orange) Peel Extract
Citrus Aurantifolia (Lime) Peel Water	Citrus Aurantium Dulcis (Orange) Peel Oil
Citrus Aurantifolia (Lime) Seed Oil	Citrus Aurantium Dulcis (Orange) Peel Powder
Citrus Aurantifolia (Lime) Seed Oil Unsaponifiables	Citrus Aurantium Dulcis (Orange) Peel Wax
Citrus Aurantium Amara (Bitter Orange) Flower Extract	Citrus Aurantium Dulcis (Orange) Seed Extract
Citrus Aurantium Amara (Bitter Orange) Flower Oil	Citrus Aurantium Dulcis (Orange) Seed Oil
Citrus Aurantium Amara (Bitter Orange) Flower Water	Citrus Aurantium Dulcis (Orange) Seed Oil Unsaponifiables
Citrus Aurantium Amara (Bitter Orange) Flower Wax	Citrus Aurantium Sinensis (Orange) Fiber
Citrus Aurantium Amara (Bitter Orange) Fruit Extract	Citrus Aurantium Sinensis Peel Extract
Citrus Aurantium Amara (Bitter Orange) Fruit Juice Extract	Citrus Aurantium Sinensis Powder
Citrus Aurantium Amara (Bitter Orange) Leaf/Twig Extract	Citrus Aurantium Tachibana Peel Extract
Citrus Aurantium Amara (Bitter Orange) Leaf/Twig Oil	Citrus Clementina Fruit Extract
Citrus Aurantium Amara (Bitter Orange) Peel	Citrus Clementina Juice
Citrus Aurantium Amara (Bitter Orange) Peel Extract	Citrus Clementina Peel Oil
Citrus Aurantium Amara (Bitter Orange) Peel Oil	Citrus Depressa Fruit Extract
Citrus Aurantium Amara (Bitter Orange) Peel Powder	Citrus Depressa Fruit Water
Citrus Aurantium Bergamia (Bergamot) Fruit Extract	Citrus Depressa Peel Extract
Citrus Aurantium Bergamia (Bergamot) Fruit Oil	Citrus Depressa Peel Powder
Citrus Aurantium Bergamia (Bergamot) Fruit Water	Citrus Glauca Fruit Extract
Citrus Aurantium Bergamia (Bergamot) Leaf Extract	Citrus Grandis (Grapefruit)
Citrus Aurantium Bergamia (Bergamot) Leaf Oil	Citrus Grandis (Grapefruit) Extract
Citrus Aurantium Bergamia (Bergamot) Peel Oil	Citrus Grandis (Grapefruit) Fruit Extract
Citrus Aurantium Bergamia (Bergamot) Peel Water	Citrus Grandis (Grapefruit) Fruit Water
Citrus Aurantium Curassuiviensis Peel Oil	Citrus Grandis (Grapefruit) Juice
Citrus Aurantium Dulcis (Orange) Flower	Citrus Grandis (Grapefruit) Leaf Extract



Citrus Grandis (Grapefruit) Peel  
 Citrus Grandis (Grapefruit) Peel Extract  
 Citrus Grandis (Grapefruit) Peel Oil  
 Citrus Grandis (Grapefruit) Peel Powder  
 Citrus Grandis (Grapefruit) Seed Extract  
 Citrus Grandis (Grapefruit) Seed Oil  
 Citrus Grandis (Grapefruit) Seed Oil Unsapomifiabiles  
 Citrus Grandis/Paradisi Fruit Water  
 Citrus Grandis Peel/Seed Extract  
 Citrus Hassaku Fruit Extract  
 Citrus Hassaku/Natsudaikai Fruit Juice  
 Citrus Hassaku/Natsudaikai Fruit Powder  
 Citrus Hassaku/Natsudaikai Peel Powder  
 Citrus Hystrix Leaf Extract  
 Citrus Iyo Fruit Extract  
 Citrus Iyo Oil  
 Citrus Iyo Peel Extract  
 Citrus Iyo Peel Oil  
 Citrus Iyo Peel Water  
 Citrus Jabara Juice  
 Citrus Jabara Peel Extract  
 Citrus Jabara Peel Water  
 Citrus Jabara Peel Powder  
 Citrus Jabara Pericarp Extract  
 Citrus Japonica Fruit Extract  
 Citrus Junos Extract  
 Citrus Junos Fruit Extract  
 Citrus Junos Fruit Juice  
 Citrus Junos Fruit Oil  
 Citrus Junos Fruit Powder  
 Citrus Junos Fruit Water  
 Citrus Junos Peel Extract  
 Citrus Junos Peel Oil  
 Citrus Junos Peel Powder  
 Citrus Junos Peel Water  
 Citrus Junos Seed Extract  
 Citrus Junos Seed Oil  
 Citrus Limon (Lemon) Flower/Leaf/Stem Extract  
 Citrus Limon (Lemon) Flower/Leaf/Stem Oil  
 Citrus Limon (Lemon) Fruit Extract  
 Citrus Limon (Lemon) Fruit Oil  
 Citrus Limon (Lemon) Fruit Powder  
 Citrus Limon (Lemon) Fruit Water  
 Citrus Limon (Lemon) Juice  
 Citrus Limon (Lemon) Juice Extract  
 Citrus Limon (Lemon) Juice Powder  
 Citrus Limon (Lemon) Leaf Extract  
 Citrus Limon (Lemon) Leaf Oil  
 Citrus Limon (Lemon) Leaf/Peel/Stem Oil  
 Citrus Limon (Lemon) Peel  
 Citrus Limon (Lemon) Peel Extract  
 Citrus Limon (Lemon) Peel Oil  
 Citrus Limon (Lemon) Peel Powder  
 Citrus Limon (Lemon) Peel Water  
 Citrus Limon (Lemon) Peel Wax  
 Citrus Limon (Lemon) Seed Oil  
 Citrus Madurensis Fruit Extract  
 Citrus Madurensis Fruit Juice  
 Citrus Medica Vulgaris Fruit Extract  
 Citrus Medica Vulgaris Peel Oil  
 Citrus Natsudaikai Flower Water  
 Citrus Natsudaikai Peel Extract  
 Citrus Nobilis (Mandarin Orange)  
 Citrus Nobilis (Mandarin Orange) Fruit Extract  
 Citrus Nobilis (Mandarin Orange) Fruit Juice  
 Citrus Nobilis (Mandarin Orange) Oil  
 Citrus Nobilis (Mandarin Orange) Peel Extract  
 Citrus Nobilis (Mandarin Orange) Peel Oil  
 Citrus Nobilis (Mandarin Orange) Peel Powder  
 Citrus Nobilis (Mandarin Orange) Water  
 Citrus Paradisi (Grapefruit) Fruit Extract  
 Citrus Paradisi (Grapefruit) Fruit Water  
 Citrus Paradisi (Grapefruit) Juice  
 Citrus Paradisi (Grapefruit) Peel Extract

Ingredient	FDA Code†	Product Category	Maximum Concentration of Use
Citrus Paradisi (Grapefruit) Peel Oil		Citrus Tangelo Fruit Juice	
Citrus Paradisi (Grapefruit) Seed Extract		Citrus Tangelo Fruit Powder	
Citrus Paradisi (Grapefruit) Seed Oil		Citrus Tangelo Peel Powder	
Citrus Reticulata (Tangerine) Extract		Citrus Tangerina (Tangerine) Extract	
Citrus Reticulata (Tangerine) Fruit		Citrus Tangerina (Tangerine) Fruit	
Citrus Reticulata (Tangerine) Fruit Extract		Citrus Tangerina (Tangerine) Fruit Water	
Citrus Reticulata (Tangerine) Fruit Water		Citrus Tangerina (Tangerine) Peel	
Citrus Reticulata (Tangerine) Leaf Oil		Citrus Tangerina (Tangerine) Peel Extract	
Citrus Reticulata (Tangerine) Leaf Water		Citrus Tangerina (Tangerine) Peel Oil	
Citrus Reticulata (Tangerine) Peel Extract		Citrus Tankaan Fruit Extract	
Citrus Reticulata (Tangerine) Peel Oil		Citrus Tankaan Fruit Water	
Citrus Reticulata (Tangerine) Peel Powder		Citrus Unshiu/Citrus Reticulata/Citrus Iyo Fruit Water	
Citrus Shunkokan Fruit Extract		Citrus Unshiu Extract	
Citrus Shunkokan Peel Extract		Citrus Unshiu Flower Powder	
Citrus Sinensis (Orange) Fruit Extract		Citrus Unshiu Flower Water	
Citrus Sinensis (Orange) Fruit Water		Citrus Unshiu Fruit Extract	
Citrus Sinensis Sanguinello (Blood Orange) Peel Oil		Citrus Unshiu Fruit Juice	
Citrus Sphaerocarpa Fruit Juice		Citrus Unshiu Fruit Oil	
Citrus Sudachi Fruit Extract		Citrus Unshiu Fruit Powder	
Citrus Sudachi Fruit Juice		Citrus Unshiu Fruit Water	
Citrus Sunki Peel Extract		Citrus Unshiu Peel Extract	
Citrus Tachibana Peel Extract		Citrus Unshiu Peel Powder	
Citrus Tachibana/Reticulata Fruit Juice		Citrus Unshiu Peel Water	
Citrus Tachibana/Reticulata Peel Oil		Citrus Unshiu Pericarp Extract	
Citrus Tachibana/Reticulata Peel Powder		Citrus Unshiu/Sinensis/Reticulata Fruit Extract	
Citrus Tamurana Flower Extract		Microcitrus Australasica Fruit Extract	
Citrus Tamurana Fruit Extract		Microcitrus Australis Fruit Extract	
Citrus Aurantifolia (Lime) Flower Extract	02B	Bubble baths	0.0005%
Citrus Aurantifolia (Lime) Flower Extract	02D	Other bath preparations	0.0005%
Citrus Aurantifolia (Lime) Flower Extract	04E	Other fragrance preparations	0.0005%

Citrus Aurantifolia (Lime) Flower Extract	05F	Shampoos (noncoloring)	0.005%
Citrus Aurantifolia (Lime) Flower Extract	10A	Bath soaps and detergents	0.0005%
Citrus Aurantifolia (Lime) Flower Extract	12D	Body and hand products not spray	0.0005%
Citrus Aurantifolia (Lime) Fruit Extract	02D	Other bath preparations	0.002%
Citrus Aurantifolia (Lime) Fruit Extract	04E	Other fragrance preparations	0.001%
Citrus Aurantifolia (Lime) Fruit Extract	05A	Hair conditioners	0.01%
Citrus Aurantifolia (Lime) Fruit Extract	05D	Permanent waves	0.01%
Citrus Aurantifolia (Lime) Fruit Extract	05F	Shampoos (noncoloring)	0.0005-0.005%
Citrus Aurantifolia (Lime) Fruit Extract	05G	Tonics, dressings and other hair grooming aids	0.01%
Citrus Aurantifolia (Lime) Fruit Extract	05I	Other hair preparations (noncoloring)	0.005%
Citrus Aurantifolia (Lime) Fruit Extract	10A	Bath soaps and detergents	0.005%
Citrus Aurantifolia (Lime) Fruit Extract	10E	Other personal cleanliness products	0.06-0.2%
Citrus Aurantifolia (Lime) Fruit Extract	11E	Shaving cream (aerosol, brushless and lather)	0.0002-0.0097%
Citrus Aurantifolia (Lime) Fruit Extract	12A	Skin cleansing (cold creams, cleansing lotions, liquids and pads)	0.0001-0.002%
Citrus Aurantifolia (Lime) Fruit Extract	12D	Body and hand products not spray	0.001-0.2%
Citrus Aurantifolia (Lime) Fruit Extract	12E	Foot powders and sprays	0.0009%
Citrus Aurantifolia (Lime) Fruit Extract	12F	Moisturizing products not spray	0.05%
Citrus Aurantifolia (Lime) Fruit Extract	12H	Paste masks and mud packs	0.0025%
Citrus Aurantifolia (Lime) Peel	12H	Paste masks and mud packs	1.5%

Citrus Aurantifolia (Lime) Peel Extract	05F	Shampoos (noncoloring)	0.00025%
Citrus Aurantifolia (Lime) Peel Extract	12A	Skin cleansing (cold creams, cleansing lotions, liquids and pads)	0.0005%
Citrus Aurantifolia (Lime) Peel Extract	12D	Body and hand products not spray	0.009%
Citrus Aurantifolia (Lime) Peel Extract	12F	Moisturizing products not spray	0.0005%
Citrus Aurantifolia (Lime) Peel Extract	12H	Paste masks and mud packs	0.00001%
Citrus Aurantifolia (Lime) Peel Extract	12J	Other skin care products	0.001-0.025%
Citrus Aurantium Amara (Bitter Orange) Flower Extract	12C	Face and neck products not spray	5%
Citrus Aurantium Amara (Bitter Orange) Flower Extract	12D	Body and hand products not spray	0.023%
Citrus Aurantium Amara (Bitter Orange) Flower Oil	02A	Bath oils, tablets and salts	0.001%
Citrus Aurantium Amara (Bitter Orange) Flower Oil	05F	Shampoos (noncoloring)	0.001%
Citrus Aurantium Amara (Bitter Orange) Flower Oil	10A	Bath soaps and detergents	0.001%
Citrus Aurantium Amara (Bitter Orange) Flower Oil	12A	Skin cleansing (cold creams, cleansing lotions, liquids and pads)	0.02%
Citrus Aurantium Amara (Bitter Orange) Flower Oil	12C	Face and neck products not spray	0.4%
Citrus Aurantium Amara (Bitter Orange) Flower Oil	12D	Body and hand products not spray	0.001-0.1%
Citrus Aurantium Amara (Bitter Orange) Flower Oil	12G	Night products not spray	0.6%
Citrus Aurantium Amara (Bitter Orange) Flower Oil	12H	Paste masks and mud packs	0.02%
Citrus Aurantium Amara (Bitter Orange) Flower Water	12C	Face and neck products	

			not spray	0.0005%
Citrus Aurantium Amara (Bitter Orange) Flower Water	12G		Night products not spray	2-4%
Citrus Aurantium Amara (Bitter Orange) Flower Water	12H		Paste masks and mud packs	0.0004%
Citrus Aurantium Amara (Bitter Orange) Fruit Extract	03C		Eye shadow	0.0001%
Citrus Aurantium Amara (Bitter Orange) Fruit Extract	03D		Eye lotion	0.0002%
Citrus Aurantium Amara (Bitter Orange) Fruit Extract	03G		Other eye makeup preparations	0.002%
Citrus Aurantium Amara (Bitter Orange) Fruit Extract	07C		Foundations	0.00002%
Citrus Aurantium Amara (Bitter Orange) Fruit Extract	07E		Lipstick	0.002%
Citrus Aurantium Amara (Bitter Orange) Fruit Extract	07H		Makeup fixatives	0.00002%
Citrus Aurantium Amara (Bitter Orange) Fruit Extract	12A		Skin cleansing (cold creams, cleansing lotions, liquids and pads)	0.0001%
Citrus Aurantium Amara (Bitter Orange) Fruit Extract	12C		Face and neck products not spray	0.00002%
Citrus Aurantium Amara (Bitter Orange) Fruit Extract	12D		Body and hand products not spray	0.0002%
Citrus Aurantium Amara (Bitter Orange) Leaf/Twig Oil	12A		Skin cleansing (cold creams, cleansing lotions, liquids and pads)	0.04%
Citrus Aurantium Amara (Bitter Orange) Leaf/Twig Oil	12D		Body and hand products not spray	1.5%
Citrus Aurantium Amara (Bitter Orange) Leaf/Twig Oil	12G		Night products not spray	0.1%
Citrus Aurantium Amara (Bitter Orange) Peel Extract	03C		Eye shadow	0.18%
Citrus Aurantium Amara (Bitter Orange) Peel Extract	05A		Hair conditioners	0.001%
Citrus Aurantium Amara (Bitter Orange) Peel Extract	05F		Shampoos (noncoloring)	0.001%

Citrus Aurantium Amara (Bitter Orange) Peel Extract	05G	Tonics, dressings and other hair grooming aids	0.001%
Citrus Aurantium Amara (Bitter Orange) Peel Extract	07A	Blushers (all types)	0.0002%
Citrus Aurantium Amara (Bitter Orange) Peel Extract	07C	Foundations	0.0002%
Citrus Aurantium Amara (Bitter Orange) Peel Extract	07E	Lipstick	0.0002%
Citrus Aurantium Amara (Bitter Orange) Peel Extract	08A	Basecoats and undercoats (manicuring preparations)	0.00002%
Citrus Aurantium Amara (Bitter Orange) Peel Extract	08E	Nail polish and enamel	0.00014%
Citrus Aurantium Amara (Bitter Orange) Peel Extract	12C	Face and neck products not spray	0.0005%
Citrus Aurantium Amara (Bitter Orange) Peel Oil	07E	Lipstick	0.75%
Citrus Aurantium Amara (Bitter Orange) Peel Oil	10A	Bath soaps and detergents	0.25%
Citrus Aurantium Amara (Bitter Orange) Peel Oil	12A	Skin cleansing (cold creams, cleansing lotions, liquids and pads)	0.2%
Citrus Aurantium Amara (Bitter Orange) Peel Oil	12C	Face and neck products not spray	2%
Citrus Aurantium Amara (Bitter Orange) Peel Oil	12D	Body and hand products not spray	0.9%
Citrus Aurantium Amara (Bitter Orange) Peel Oil	12G	Night products not spray	0.2%
Citrus Aurantium Amara (Bitter Orange) Peel Oil	12H	Paste masks and mud packs	0.05%
Citrus Aurantium Amara (Bitter Orange) Peel Powder	12A	Skin cleansing (cold creams, cleansing lotions, liquids and pads)	6%
Citrus Aurantium Bergamia (Bergamot) Fruit Extract	05A	Hair conditioners	0.000001-0.0001%
Citrus Aurantium Bergamia (Bergamot) Fruit Extract	05B	Hair sprays pump spray	0.000001%
Citrus Aurantium Bergamia (Bergamot) Fruit Extract	05F	Shampoos (noncoloring)	0.000001-0.0001%

Citrus Aurantium Bergamia (Bergamot) Fruit Extract	12A	Skin cleansing (cold creams, cleansing lotions, liquids and pads)	0.0025-0.0063%
Citrus Aurantium Bergamia (Bergamot) Fruit Extract	12C	Face and neck products not spray	0.0001-0.001%
Citrus Aurantium Bergamia (Bergamot) Fruit Extract	12J	Other skin care products	0.82%
Citrus Aurantium Bergamia (Bergamot) Fruit Oil	05F	Shampoos (noncoloring)	0.005%
Citrus Aurantium Bergamia (Bergamot) Fruit Oil	05G	Tonics, dressings and other hair grooming aids	0.0017-0.05%
Citrus Aurantium Dulcis (Orange) Flower Extract	02B	Bubble baths	0.1%
Citrus Aurantium Dulcis (Orange) Flower Extract	03D	Eye lotion	0.01%
Citrus Aurantium Dulcis (Orange) Flower Extract	03G	Other eye makeup preparations	0.002%
Citrus Aurantium Dulcis (Orange) Flower Extract	04A	Colognes and toilet waters	0.01%
Citrus Aurantium Dulcis (Orange) Flower Extract	05A	Hair conditioners	0.0025-0.005%
Citrus Aurantium Dulcis (Orange) Flower Extract	05B	Hair sprays aerosol pump spray	0.0025% 0.0025%
Citrus Aurantium Dulcis (Orange) Flower Extract	05D	Permanent waves	0.002%
Citrus Aurantium Dulcis (Orange) Flower Extract	05F	Shampoos (noncoloring)	0.0025-0.005%
Citrus Aurantium Dulcis (Orange) Flower Extract	05G	Tonics, dressings and other hair grooming aids	0.0013%
Citrus Aurantium Dulcis (Orange) Flower Extract	07C	Foundations	0.002%
Citrus Aurantium Dulcis (Orange) Flower Extract	07H	Makeup fixatives	0.002%
Citrus Aurantium Dulcis (Orange) Flower Extract	08B	Cuticle softeners	0.001%
Citrus Aurantium Dulcis (Orange) Flower Extract	10A	Bath soaps and detergents	0.01%
Citrus Aurantium Dulcis (Orange) Flower Extract	10E	Other personal cleanliness products	0.01-0.2%

Citrus Aurantium Dulcis (Orange) Flower Extract	11A	Aftershave lotions	0.007%
Citrus Aurantium Dulcis (Orange) Flower Extract	11E	Shaving cream (aerosol, brushless and lather)	0.000023%
Citrus Aurantium Dulcis (Orange) Flower Extract	12A	Skin cleansing (cold creams, cleansing lotions, liquids and pads)	0.0001%
Citrus Aurantium Dulcis (Orange) Flower Extract	12D	Body and hand products not spray spray	0.01-0.2% 0.01%
Citrus Aurantium Dulcis (Orange) Flower Extract	12F	Moisturizing products not spray	0.00013%
Citrus Aurantium Dulcis (Orange) Flower Extract	12G	Night products not spray	0.00003%
Citrus Aurantium Dulcis (Orange) Flower Extract	12H	Paste masks and mud packs	0.0002-0.002%
Citrus Aurantium Dulcis (Orange) Flower Extract	12J	Other skin care preparations	0.00013-0.001%
Citrus Aurantium Dulcis (Orange) Flower Oil	07E	Lipstick	0.9%
Citrus Aurantium Dulcis (Orange) Flower Oil	12A	Skin cleansing (cold creams, cleansing lotions, liquids and pads)	0.000001%
Citrus Aurantium Dulcis (Orange) Fruit Extract	03D	Eye lotion	0.1%
Citrus Aurantium Dulcis (Orange) Fruit Extract	05A	Hair conditioners	0.0054%
Citrus Aurantium Dulcis (Orange) Fruit Extract	05F	Shampoos (noncoloring)	0.0007%
Citrus Aurantium Dulcis (Orange) Fruit Extract	05I	Other hair preparations (noncoloring)	0.25%
Citrus Aurantium Dulcis (Orange) Fruit Extract	08B	Cuticle softeners	0.2%
Citrus Aurantium Dulcis (Orange) Fruit Extract	10A	Bath soaps and detergents	0.041%
Citrus Aurantium Dulcis (Orange) Fruit Extract	10E	Other personal cleanliness products	0.004-0.039%
Citrus Aurantium Dulcis (Orange) Fruit Extract	11A	Aftershave lotions	0.1%



Citrus Aurantium Dulcis (Orange) Fruit Extract	12A	Skin cleansing (cold creams, cleansing lotions, liquids and pads)	0.00003-0.2%
Citrus Aurantium Dulcis (Orange) Fruit Extract	12C	Face and neck products not spray	0.002-0.32%
Citrus Aurantium Dulcis (Orange) Fruit Extract	12D	Body and hand products not spray	0.0005-0.12%
Citrus Aurantium Dulcis (Orange) Fruit Extract	12F	Moisturizing products not spray	0.00003-0.004%
Citrus Aurantium Dulcis (Orange) Fruit Extract	12G	Night products not spray	1.2%
Citrus Aurantium Dulcis (Orange) Fruit Extract	12H	Paste masks and mud packs	0.002-0.04%
Citrus Aurantium Dulcis (Orange) Fruit Extract	13B	Indoor tanning preparations	0.001%
Citrus Aurantium Dulcis (Orange) Fruit Water	07C	Foundations	2%
Citrus Aurantium Dulcis (Orange) Fruit Water	12A	Skin cleansing (cold creams, cleansing lotions, liquids and pads)	2%
Citrus Aurantium Dulcis (Orange) Fruit Water	12C	Face and neck products not spray	10%
Citrus Aurantium Dulcis (Orange) Fruit Water	12D	Body and hand products not spray	3%
Citrus Aurantium Dulcis (Orange) Fruit Water	12H	Paste masks and mud packs	19%
Citrus Aurantium Dulcis (Orange) Juice	05G	Tonics, dressings and other hair grooming aids	0.000038%
Citrus Aurantium Dulcis (Orange) Oil	02A	Bath oils, tablets and salts	0.93%
Citrus Aurantium Dulcis (Orange) Oil	03D	Eye lotion	0.033%
Citrus Aurantium Dulcis (Orange) Oil	05E	Rinses (noncoloring)	0.033%
Citrus Aurantium Dulcis (Orange) Oil	05F	Shampoos (noncoloring)	0.043%

Citrus Aurantium Dulcis (Orange) Oil	07A	Blushers (all types)	0.047%
Citrus Aurantium Dulcis (Orange) Oil	07B	Face powders	0.0014%
Citrus Aurantium Dulcis (Orange) Oil	07C	Foundations	0.0066-0.025%
Citrus Aurantium Dulcis (Orange) Oil	07E	Lipstick	0.033-0.95%
Citrus Aurantium Dulcis (Orange) Oil	08B	Cuticle softeners	0.025%
Citrus Aurantium Dulcis (Orange) Oil	12A	Skin cleansing (cold creams, cleansing lotions, liquids and pads)	0.021-0.2%
Citrus Aurantium Dulcis (Orange) Oil	12C	Face and neck products not spray spray	0.025-0.14% 0.011%
Citrus Aurantium Dulcis (Orange) Oil	12D	Body and hand products not spray	0.066%
Citrus Aurantium Dulcis (Orange) Oil	12F	Moisturizing products not spray	0.033%
Citrus Aurantium Dulcis (Orange) Oil	13A	Suntan products not spray	0.02%
Citrus Aurantium Dulcis (Orange) Peel Extract	02B	Bubble baths	0.0025%
Citrus Aurantium Dulcis (Orange) Peel Extract	02D	Other bath preparations	0.0025%
Citrus Aurantium Dulcis (Orange) Peel Extract	03D	Eye lotion	0.0002%
Citrus Aurantium Dulcis (Orange) Peel Extract	03G	Other eye makeup preparations	0.0005%
Citrus Aurantium Dulcis (Orange) Peel Extract	04E	Other fragrance preparations	0.001%
Citrus Aurantium Dulcis (Orange) Peel Extract	05A	Hair conditioners	0.001%
Citrus Aurantium Dulcis (Orange) Peel Extract	05B	Hair sprays pump spray	0.001%

Citrus Aurantium Dulcis (Orange) Peel Extract	05F	Shampoos (noncoloring)	0.0001-0.001%
Citrus Aurantium Dulcis (Orange) Peel Extract	05G	Tonics, dressings and other hair grooming aids	0.00001%
Citrus Aurantium Dulcis (Orange) Peel Extract	07E	Lipstick	1.9%
Citrus Aurantium Dulcis (Orange) Peel Extract	10A	Bath soaps and detergents	0.0001%
Citrus Aurantium Dulcis (Orange) Peel Extract	10E	Other personal cleanliness products	0.000025-0.008%
Citrus Aurantium Dulcis (Orange) Peel Extract	12A	Skin cleansing (cold creams, cleansing lotions, liquids and pads)	0.00005-0.65%
Citrus Aurantium Dulcis (Orange) Peel Extract	12C	Face and neck products not spray	0.0002-0.013%
Citrus Aurantium Dulcis (Orange) Peel Extract	12D	Body and hand products not spray	0.00002-0.33%
Citrus Aurantium Dulcis (Orange) Peel Extract	12F	Moisturizing products not spray	0.0065%
Citrus Aurantium Dulcis (Orange) Peel Extract	12G	Night products not spray	0.0001%
Citrus Aurantium Dulcis (Orange) Peel Extract	12H	Paste masks and mud packs	0.0002-0.0011%
Citrus Aurantium Dulcis (Orange) Peel Oil	02D	Other bath preparations	0.33%
Citrus Aurantium Dulcis (Orange) Peel Oil	03E	Eye makeup remover	0.1%
Citrus Aurantium Dulcis (Orange) Peel Oil	05A	Hair conditioners	0.00002-29%
Citrus Aurantium Dulcis (Orange) Peel Oil	05F	Shampoos (noncoloring)	0.00002%
Citrus Aurantium Dulcis (Orange) Peel Oil	05G	Tonics, dressings and other hair grooming aids	0.00038%
Citrus Aurantium Dulcis (Orange) Peel Oil	08E	Nail polish and enamel	0.5%
Citrus Aurantium Dulcis (Orange) Peel Oil	08G	Other manicuring preparations	0.54%

Citrus Aurantium Dulcis (Orange) Peel Oil	10A	Bath soaps and detergents	0.1%
Citrus Aurantium Dulcis (Orange) Peel Oil	11E	Shaving cream (aerosol, brushless and lather)	0.17%
Citrus Aurantium Dulcis (Orange) Peel Oil	12A	Skin cleansing (cold creams, cleansing lotions, liquids and pads)	0.001-0.1%
Citrus Aurantium Dulcis (Orange) Peel Oil	12B	Depilatories	0.1%
Citrus Aurantium Dulcis (Orange) Peel Oil	12C	Face and neck products not spray	0.12-0.3%
Citrus Aurantium Dulcis (Orange) Peel Oil	12D	Body and hand products not spray	0.03-0.4%
Citrus Aurantium Dulcis (Orange) Peel Oil	12G	Night products not spray	0.3%
Citrus Aurantium Dulcis (Orange) Peel Oil	12H	Paste masks and mud packs	0.0066%
Citrus Aurantium Dulcis (Orange) Peel Oil	12J	Other skin care preparations	0.14%
Citrus Aurantium Dulcis (Orange) Peel Powder	12A	Skin cleansing (cold creams, cleansing lotions, liquids and pads)	6%
Citrus Aurantium Dulcis (Orange) Peel Wax	03D	Eye lotion	0.16%
Citrus Aurantium Dulcis (Orange) Peel Wax	03F	Mascara	0.15%
Citrus Aurantium Dulcis (Orange) Peel Wax	05A	Hair conditioners	0.005%
Citrus Aurantium Dulcis (Orange) Peel Wax	05F	Shampoos (noncoloring)	0.045%
Citrus Aurantium Dulcis (Orange) Peel Wax	07E	Lipstick	0.5%
Citrus Aurantium Dulcis (Orange) Peel Wax	11A	Aftershave lotions	0.15%
Citrus Aurantium Dulcis (Orange) Peel Wax	12A	Skin cleansing (cold creams, cleansing lotions liquids and pads)	0.39%
Citrus Aurantium Dulcis (Orange) Peel Wax	12J	Other skin care preparations	0.07%
Citrus Aurantium Tachibana Peel Extract	12J	Other skin care preparations	0.0008%

Citrus Depressa Peel Extract	12D	Body and hand products not spray	0.0014%
Citrus Glauca Fruit Extract	05A	Hair conditioners	0.003%
Citrus Glauca Fruit Extract	05F	Shampoos (noncoloring)	0.0051%
Citrus Grandis (Grapefruit)	03D	Eye lotion	0.5%
Citrus Grandis (Grapefruit) Extract	05F	Shampoos (noncoloring)	0.01%
Citrus Grandis (Grapefruit) Fruit Extract	02A	Bath oils, tablets and salts	0.005%
Citrus Grandis (Grapefruit) Fruit Extract	02D	Other bath preparations	0.01%
Citrus Grandis (Grapefruit) Fruit Extract	04A	Colognes and toilet waters	0.01%
Citrus Grandis (Grapefruit) Fruit Extract	05A	Hair conditioners	0.000001-0.01%
Citrus Grandis (Grapefruit) Fruit Extract	05D	Permanent waves	0.01%
Citrus Grandis (Grapefruit) Fruit Extract	05E	Rinses (noncoloring)	0.0005%
Citrus Grandis (Grapefruit) Fruit Extract	05F	Shampoo (noncoloring)	0.0000005-0.01%
Citrus Grandis (Grapefruit) Fruit Extract	05G	Tonics, dressings and other hair grooming aids	0.005-0.01%
Citrus Grandis (Grapefruit) Fruit Extract	07E	Lipstick	0.01-0.02%
Citrus Grandis (Grapefruit) Fruit Extract	10A	Bath soaps and detergents	0.1%
Citrus Grandis (Grapefruit) Fruit Extract	10E	Other personal cleanliness products	0.001-0.002%
Citrus Grandis (Grapefruit) Fruit Extract	12A	Skin cleansing (cold creams, cleansing lotions, liquids and pads)	0.0005-1%
Citrus Grandis (Grapefruit) Fruit Extract	12C	Face and neck products not spray	0.015-15%
Citrus Grandis (Grapefruit) Fruit Extract	12D	Body and hand products not spray	0.0001-0.09%

Citrus Grandis (Grapefruit) Fruit Extract	12E	Foot powders and sprays	0.0001%
Citrus Grandis (Grapefruit) Fruit Extract	12H	Paste masks and mud packs	0.1-8%
Citrus Grandis (Grapefruit) Fruit Extract	12I	Skin fresheners	0.01%
Citrus Grandis (Grapefruit) Fruit Extract	12J	Other skin care preparations	0.01%
Citrus Grandis (Grapefruit) Fruit Extract	13A	Suntan products not spray	0.0001%
Citrus Grandis (Grapefruit) Fruit Water	12A	Skin cleansing (cold creams, cleansing lotions, liquids and pads)	0.0029%
Citrus Grandis (Grapefruit) Juice	12A	Skin cleansing (cold creams, cleansing lotions liquids and pads)	0.01%
Citrus Grandis (Grapefruit) Peel Extract	03F	Mascara	0.5%
Citrus Grandis (Grapefruit) Peel Extract	12A	Skin cleansing (cold cream, cleansing lotions, liquids and pads)	0.0225%
Citrus Grandis (Grapefruit) Peel Extract	12C	Face and neck products not spray	0.0001%
Citrus Grandis (Grapefruit) Peel Extract	12D	Body and hand products not spray	0.0005%
Citrus Grandis (Grapefruit) Peel Extract	12F	Moisturizing creams, lotions and powders not spray	0.009%
Citrus Grandis (Grapefruit) Peel Extract	12H	Pastes masks and mud packs	0.03%
Citrus Grandis (Grapefruit) Peel Extract	12J	Other skin care preparations	0.0008%
Citrus Grandis (Grapefruit) Peel Oil	02D	Other bath preparations	0.0014%
Citrus Grandis (Grapefruit) Peel Oil	05F	Shampoos (noncoloring)	0.005%
Citrus Grandis (Grapefruit) Peel Oil	12B	Depilatories	0.0001-0.05%
Citrus Grandis (Grapefruit) Peel Oil	12D	Body and hand creams not spray	0.0004%

Citrus Grandis (Grapefruit) Peel Oil	12H	Paste masks and mud packs	0.00004%
Citrus Grandis (Grapefruit) Peel Oil	12J	Other skin care preparations	0.0008%
Citrus Grandis (Grapefruit) Seed Extract	12A	Skin cleansing (cold creams, cleansing lotions, liquids and pads)	0.75%
Citrus Grandis (Grapefruit) Seed Extract	12C	Face and neck products not spray	0.053-2%
Citrus Grandis (Grapefruit) Seed Extract	12H	Paste masks and mud packs	0.75%
Citrus Grandis (Grapefruit) Seed Extract	12I	Skin fresheners	0.15%
Citrus Japonica Fruit Extract	05A	Hair conditioners	0.0038%
Citrus Japonica Fruit Extract	05F	Shampoos (noncoloring)	0.0038%
Citrus Junos Fruit Extract	04B	Perfumes	0.001%
Citrus Junos Fruit Extract	07C	Foundations	0.001%
Citrus Junos Fruit Extract	07E	Lipstick	0.001%
Citrus Junos Fruit Extract	10E	Other personal cleanliness products	0.0005%
Citrus Junos Fruit Extract	12A	Skin cleansing (cold creams, cleansing lotions, liquids and pads)	0.001%
Citrus Junos Fruit Extract	12C	Face and neck products not spray	0.002%
Citrus Junos Fruit Extract	12D	Body and hand products not spray spray	0.0005-0.001% 0.0005%
Citrus Junos Peel Extract	07E	Lipstick	0.0012%
Citrus Junos Peel Extract	07G	Rouges	0.0012%
Citrus Junos Peel Extract	12F	Moisturizing products not spray	0.036%

Citrus Junos Seed Extract	02A	Bath oils, tablets and salts	0.001%
Citrus Junos Seed Extract	03D	Eye lotion	0.001%
Citrus Junos Seed Extract	07C	Foundations	0.001%
Citrus Junos Seed Extract	12A	Skin cleansing (cold creams, cleansing lotions, liquids and pads)	0.001%
Citrus Junos Seed Extract	12C	Face and neck products not spray	0.0045%
Citrus Junos Seed Extract	12F	Moisturizing products not spray	0.001%
Citrus Junos Seed Oil	05G	Tonics dressings and other hair grooming aids	0.01%
Citrus Junos Seed Oil	12C	Face and neck products not spray	0.1%
Citrus Junos Seed Oil	12D	Body and hand products not spray	0.1%
Citrus Limon (Lemon) Fruit Extract	05A	Hair conditioners	0.004%
Citrus Limon (Lemon) Fruit Extract	05D	Permanent waves	0.002%
Citrus Limon (Lemon) Fruit Extract	05F	Shampoos (noncoloring)	0.005%
Citrus Limon (Lemon) Fruit Extract	05I	Other hair preparations (noncoloring)	0.004%
Citrus Limon (Lemon) Fruit Extract	07C	Foundations	0.02-0.04%
Citrus Limon (Lemon) Fruit Extract	07E	Lipstick	0.03%
Citrus Limon (Lemon) Fruit Extract	08B	Cuticle softeners	0.0001%
Citrus Limon (Lemon) Fruit Extract	08G	Other manicuring preparations	0.01-0.5%
Citrus Limon (Lemon) Fruit Extract	10A	Bath soaps and detergents	0.04%



Citrus Limon (Lemon) Fruit Extract	10E	Other personal cleanliness products hand scrub	0.0028-0.02% 0.039%
Citrus Limon (Lemon) Fruit Extract	11A	Aftershave lotions	0.1%
Citrus Limon (Lemon) Fruit Extract	12A	Skin cleansing (cold creams, cleansing lotions, liquids and pads)	0.0025-0.5%
Citrus Limon (Lemon) Fruit Extract	12C	Face and neck products not spray	0.24-0.5%
Citrus Limon (Lemon) Fruit Extract	12D	Body and hand products not spray	0.0001-0.4%
Citrus Limon (Lemon) Fruit Extract	12F	Moisturizing products not spray	0.004%
Citrus Limon (Lemon) Fruit Extract	12G	Night products not spray	1.2%
Citrus Limon (Lemon) Fruit Extract	12H	Paste masks and mud packs	0.002-0.5%
Citrus Limon (Lemon) Fruit Extract	12J	Other skin care preparations	0.8%
Citrus Limon (Lemon) Fruit Extract	13B	Indoor tanning products	0.001%
Citrus Limon (Lemon) Fruit Water	12A	Skin cleansing (cold creams, cleansing lotions, liquids and pads)	1%
Citrus Limon (Lemon) Juice	05F	Shampoos (noncoloring)	0.05%
Citrus Limon (Lemon) Juice	05G	Tonics, dressings and other hair grooming aids	0.05%
Citrus Limon (Lemon) Juice	12B	Depilatories	0.035%
Citrus Limon (Lemon) Juice	12C	Face products not spray	1%
Citrus Limon (Lemon) Juice Extract	12A	Skin cleansing (cold creams, cleansing lotions, liquids and pads)	0.05%
Citrus Limon (Lemon) Juice Extract	12D	Body and hand products not spray	0.2%

Citrus Limon (Lemon) Peel Extract	05A	Hair conditioners	0.0011-0.01%
Citrus Limon (Lemon) Peel Extract	05F	Shampoos (noncoloring)	0.0011%
Citrus Limon (Lemon) Peel Extract	07E	Lipstick	0.0005%
Citrus Limon (Lemon) Peel Extract	10E	Other personal cleanliness products	0.51%
Citrus Limon (Lemon) Peel Extract	12A	Skin cleansing (cold creams, cleansing lotions, liquids and pads)	0.057%
Citrus Limon (Lemon) Peel Extract	12C	Face and neck products not spray	0.0001-0.0075%
Citrus Limon (Lemon) Peel Extract	12D	Body and hand products not spray	0.25%
Citrus Limon (Lemon) Peel Extract	12F	Moisturizing creams, lotions and powders	0.012%
Citrus Limon (Lemon) Peel Extract	12H	Paste masks and mud packs	0.002-0.04%
Citrus Limon (Lemon) Peel Oil	02D	Other bath preparations	0.012%
Citrus Limon (Lemon) Peel Oil	08G	Other manicuring preparations	0.0001-0.14%
Citrus Limon (Lemon) Peel Oil	10A	Bath soaps and detergents	0.001%
Citrus Limon (Lemon) Peel Oil	10B	Deodorants (underarm) not spray	0.002%
Citrus Limon (Lemon) Peel Oil	11A	Aftershave lotions	0.0001%
Citrus Limon (Lemon) Peel Oil	12D	Body and hand products not spray	0.0001-0.14%
Citrus Limon (Lemon) Peel Oil	12E	Foot powders and sprays	0.06%
Citrus Limon (Lemon) Peel Oil	12H	Paste masks and mud packs	0.0006%
Citrus Limon (Lemon) Peel Oil	12J	Other skin care preparations	0.012-0.5%

Citrus Madurensis Fruit Extract	02D	Other bath preparations	0.0005%
Citrus Madurensis Fruit Extract	12D	Body and hand products not spray	0.0005%
Citrus Nobilis (Mandarin Orange) Fruit Extract	05A	Hair conditioners	0.001-0.01%
Citrus Nobilis (Mandarin Orange) Fruit Extract	05D	Permanent waves	0.01%
Citrus Nobilis (Mandarin Orange) Fruit Extract	05F	Shampoos (noncoloring)	0.01%
Citrus Nobilis (Mandarin Orange) Fruit Extract	05G	Tonics, dressings and other hair grooming aids	0.001-0.01%
Citrus Nobilis (Mandarin Orange) Fruit Extract	05I	Other hair preparations (noncoloring)	0.005%
Citrus Nobilis (Mandarin Orange) Fruit Extract	10A	Bath soaps and detergents	0.04%
Citrus Nobilis (Mandarin Orange) Fruit Extract	10E	Other personal cleanliness products	0.002%
Citrus Nobilis (Mandarin Orange) Fruit Extract	12A	Skin cleansing (cold creams, cleansing lotions, liquids and pads)	0.0018%
Citrus Nobilis (Mandarin Orange) Fruit Extract	12C	Face and neck products not spray	0.0018%
Citrus Nobilis (Mandarin Orange) Fruit Extract	12D	Body and hand products not spray spray	0.002-0.04% 0.0075%
Citrus Nobilis (Mandarin Orange) Oil	07G	Rouges	0.075%
Citrus Nobilis (Mandarin Orange) Peel Extract	02B	Bubble baths	0.0025%
Citrus Nobilis (Mandarin Orange) Peel Extract	02D	Other bath preparations	0.0005%
Citrus Nobilis (Mandarin Orange) Peel Extract	05A	Hair conditioners	0.00025-0.005%
Citrus Nobilis (Mandarin Orange) Peel Extract	05F	Shampoos (noncoloring)	0.00025-0.005%
Citrus Nobilis (Mandarin Orange) Peel Extract	12A	Skin cleansing (cold creams, cleansing lotions, liquids and pads)	0.0025-0.023%

Citrus Nobilis (Mandarin Orange) Peel Extract	12D	Body and hand products not spray	0.0025%
Citrus Nobilis (Mandarin Orange) Peel Extract	12F	Moisturizing products not spray	0.009%
Citrus Nobilis (Mandarin Orange) Peel Extract	12H	Paste masks and mud packs	0.0051-0.03%
Citrus Nobilis (Mandarin Orange) Peel Oil	05A	Hair conditioners	0.0005%
Citrus Nobilis (Mandarin Orange) Peel Oil	05F	Shampoos (noncoloring)	0.00005-0.03%
Citrus Nobilis (Mandarin Orange) Peel Oil	07E	Lipstick	0.0099%
Citrus Nobilis (Mandarin Orange) Peel Oil	08B	Cuticle softeners	0.012%
Citrus Nobilis (Mandarin Orange) Peel Oil	12A	Skin cleansing (cold creams, cleansing lotions, liquids and pads)	0.00005-0.02%
Citrus Nobilis (Mandarin Orange) Peel Oil	12C	Face and neck products not spray	0.05%
Citrus Nobilis (Mandarin Orange) Peel Oil	12D	Body and hand products not spray	0.00005-0.1%
Citrus Nobilis (Mandarin Orange) Peel Oil	12F	Moisturizing products not spray	0.05%
Citrus Nobilis (Mandarin Orange) Peel Oil	12G	Night products not spray	0.05%
Citrus Nobilis (Mandarin Orange) Peel Oil	12J	Other skin care preparations rinse-off	0.05%
Citrus Paradisi (Grapefruit) Fruit Extract	05F	Shampoos (noncoloring)	0.005%
Citrus Paradisi (Grapefruit) Fruit Extract	12A	Skin cleansing (cold creams, cleansing lotions, liquids and pads)	0.2%
Citrus Paradisi (Grapefruit) Fruit Extract	12C	Face and neck products not spray	0.3%

Citrus Paradisi (Grapefruit) Fruit Extract	12D	Body and hand products not spray	0.05-1.5%
Citrus Paradisi (Grapefruit) Fruit Extract	12F	Moisturizing products not spray	0.05%
Citrus Paradisi (Grapefruit) Fruit Extract	12H	Paste masks and mud packs	0.16%
Citrus Paradisi (Grapefruit) Peel Extract	12A	Skin cleansing (cold creams, cleansing lotions, liquids and pads)	0.0068%
Citrus Paradisi (Grapefruit) Peel Extract	12J	Other skin care preparations	0.0017%
Citrus Paradisi (Grapefruit) Peel Oil	05B	Hair sprays pump spray	0.00068%
Citrus Paradisi (Grapefruit) Peel Oil	12F	Moisturizing products not spray	0.5%
Citrus Tangerina (Tangerine) Peel Oil	05A	Hair conditioners	0.0000013%
Citrus Tangerina (Tangerine) Peel Oil	05F	Shampoos (noncoloring)	0.0000013%
Citrus Tangerina (Tangerine) Peel Oil	05G	Tonics, dressings and other hair grooming aids	0.0000013%
Citrus Unshiu Peel Extract	02A	Bath oils, tablets and salts	0.03%
Citrus Unshiu Peel Extract	03D	Eye lotion	0.002%
Citrus Unshiu Peel Extract	03E	Eye makeup remover	0.000002%
Citrus Unshiu Peel Extract	07C	Foundations	0.0002%
Citrus Unshiu Peel Extract	12A	Skin cleansing (cold creams, cleansing lotions, liquids and pads)	0.002-0.94%
Citrus Unshiu Peel Extract	12C	Face and neck products not spray	0.002-0.94%
Citrus Unshiu Peel Extract	12D	Body and hand products not spray	0.002-0.0095%

Citrus Unshiu Peel Extract	12F	Moisturizing products not spray	0.00095-0.002%
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\*Ingredients included in the title of the table but not found in the table were included in the concentration of use survey, but no uses were reported.

†Product category codes used by FDA

Information collected in 2013  
Table prepared: July 25, 2013