

## F. Nomenclature Conventions

The conventions used to determine INCI names for cosmetic ingredients are listed below and are divided into three areas: General Conventions, Specific Conventions (which are grouped primarily by chemical class), and Miscellaneous Conventions. These conventions are continually reviewed and modified when necessary to reflect changes in the industry, technology, and new ingredient developments. Every effort is made to ensure ingredients are named consistent with these principles. As new conventions are developed that give rise to INCI names that are different from those previously published, the older nomenclature is sometimes retained and considered to be “grandfathered”. Grandfathered names are generally published for reference only.

### GENERAL CONVENTIONS

1. Nomenclature assignments are based on the chemical composition of the intended product without qualification, and simple chemical names are used wherever possible. These assigned names are generally based on an ingredient's final composition, with the exception of organic and silicone polymers, botanical extracts, fermentation products and minerals, which are typically named by their starting materials and can include the process by which they are manufactured. For additional information, see Botanicals, Convention 30; Minerals, Convention 42; Polymers, Convention 44; Silanes and Siloxanes, Convention 52.
2. Recognized chemical abbreviations are used where applicable. A list of the abbreviations used in the *Dictionary* may be found in Part G.
3. Traditional stem names are retained as combining forms when consistent with other conventions. Commonly recognized trivial names will be utilized where appropriate, e.g., acylated derivatives of amino acids, Lauroyl Lysine, or acylated derivatives of hormones, N-Caffeoyl Serotonin. See also Rules 28a and 57.
4. Name/number combinations are used as INCI names for cosmetic ingredients only where the complexity and/ or similarity of ingredients precludes assignment of reasonable nomenclature by any other means. The stem names are suggestive of the structure or the composition of the material; e.g., rh-Oligopeptide-6, Quaternium-27, Polyurethane-5, Polysilicone-1. Where descriptive terminology is desired for a particular component of a raw material that would fall under these classifications, alternate nomenclature may be provided. Established name/ number or name/acronym combinations are also utilized, e.g., Red 4, CI 10020, HC Blue No. 10, Ceramide EOP.
5. Specific names previously established by the U.S. Pharmacopoeia (USP), National Formulary (NF), the Food Chemicals Codex (FCC), Merck Index, International Non-Proprietary Names for Pharmaceutical Substances (INN), World Health Organization (WHO), the Research Institute for Fragrance Materials (RIFM), and United States Adopted Names (USAN) are retained in many cases. Furthermore, established abbreviations and criteria are utilized for simplifying the nomenclature of families of complex ingredients where applicable. For example, the root word “alkonium” from the USAN convention to denote N,N-dimethyl N-alkyl benzyl in Benzalkonium Chloride is utilized to name other cosmetic ingredients such as Cocoalkonium Chloride. Compounds that are similar to materials described in recognized sources are given analogous names whenever possible. Examples include the Research Institute for Fragrance Materials (RIFM) names for the fragrance compounds, Linalool, Longifolene. See also the discussion on OTC drug nomenclature, “The Cosmetic-Drug Distinction” in Appendix II.
6. USAN abbreviations and criteria are utilized for simplifying the nomenclature of families of

complex ingredients where applicable; e.g., Poloxamer, Nonoxynol, “alkonium” to denote N, N'-dimethyl N-alkyl benzyl in Benzalkonium Chloride.

7. Compounds that are similar to materials described in recognized sources are given analogous names whenever possible, e.g., Cocoalkonium Chloride.
8. Names of ingredients that contain terminal numbers are generally hyphenated, (see Convention 4), and names for derivatives of hyphenated materials retain the original hyphenated term, e.g., Quaternium-18 Hectorite.
9. Hydration states are not usually expressed, with the exception of Hydrated Silica. For information on process terms, see Convention 72.
10. Compounded mixtures created by blending materials are named by listing each component in descending order of predominance. See Labeling Reminders for further information on labeling mixtures.
11. Water, ethyl alcohol and other common diluents or solvents contained in commercially available raw materials, except extracts and products derived by fermentation, have not historically been identified as part of the INCI Name. In recent years, the INC has included the identification of non-aqueous solvents in an effort to provide further transparency. See Labeling Reminders in the Introduction for additional information on the labeling of solvents and/or diluents that may be present in raw materials.
  - a. The INCI name for water, regardless of source is Water. The only exception is the INCI name Sea Water because it is sufficiently different in composition from fresh water. Botanical waters are named in accordance with Convention 30.
  - b. Purity standards or processes associated with water are not identified in the INCI name, e.g., purified water, deionized water, sterilized water.
12. For products marketed in the United States, the phrase “and other ingredients” may only be used in the label declaration when confidentiality has been granted by the U. S. Food and Drug Administration in accordance with procedures established in 21 CFR 701.3 and 720.8(a). Currently, there are no similar exclusions in the European Union *Regulation (EC) No 1223/2009*. For products marketed in Japan, the phrase “and other ingredients” may only be used in the label declaration when confidentiality has been granted by MHLW in accordance with procedures established in MHLW Notice No.990 (Sept/29/2000).
13. In order to facilitate clarity and ease of use when labeling, INCI names have been designed to require a minimum of punctuation and capitalization.

Slashes are used to designate compounds (not blends) that are produced as a mixture or are composed of more than one entity, e.g., Dipentaerythrityl Dicaprylate/Caprate, Glyceryl Cocoate/Citrate/Lactate, Styrene/MA Copolymer, Silicon/Cerium/Titanium/Zinc Oxides. Additionally, slashes are used to identify botanical materials that are hybrids (see also Convention 30b). The terms are described in alphabetical order, separated by a slash. For additional information, see Convention 21 on the identification of alkyl groupings, and Convention 44(b) on the listing of monomers.

14. Wherever new nomenclature has been adopted, every effort has been made to use the shortest name consistent with these rules. Shorthand abbreviations will be considered for names with exceedingly long character length.
15. The International Cosmetic Ingredient Nomenclature Committee, in conjunction with the Personal Care Products Council, reserves the right to provide specific nomenclature in certain cases to make the nomenclature more informative to the consumer. In particular,

terminology for ingredients related to drug active substances may be retained, (e.g., see Convention 50, Prostaglandin Derivatives).

## SPECIFIC CONVENTIONS

### ***Alkanolamides***

16. Alkanolamides are named by the specific alkyl amide stem and the appropriate abbreviation; e.g., “Acetamide MEA,” “Lauramide DEA,” “Cocamide DIPA.”

### ***Alkoxyated Materials***

17. Alkoxyated materials are named by including the alkoxylation level as the average number of moles of ethylene oxide and/or propylene oxide, and/or ethyleneimine. Ethoxylates, propoxylates, and ethyleneimine are commonly expressed by the degree of polymerization. Mixed alkoxyated ethers (i.e., contain both EO and PO) are named based on the order of addition. For example, PPG-y Glycereth-x means glycerin is first treated with x moles EO then y moles PO. PEG/PPG-x/y means that a material is treated simultaneously with EO and PO, e.g., PEG/PPG-52/32 Dimethyl Ether. PPG-x-PEG-y indicates that the material is first ethoxylated, and then propoxylated.
18. a. Ethoxylated alcohols are named by adding the suffix “eth” to the conventional stem name followed by the average number of moles of ethylene oxide, e.g., Steareth-10. Historically, where the moles of ethoxylation is 1,2, or 3, the numerical designation is sometimes omitted, e.g., Sodium Laureth Sulfate, and the definition specifies the average number of moles as 1 to 3.
- b. The term Alkoxynol-n refers to an ethoxylated alkyl phenol where n is the average ethoxylation value e.g., Nonoxynol-10. The following table references the alkoxynol stem to its alkyl group:

<b>Alkoxynol</b>	<b>Alkyl Group</b>
Octoxynol	Tetramethylbutyl
Nonoxynol	Nonyl
Dodoxynol	Dodecyl or Tributyl
Pentadoxynol	Pentadecyl

19. a. The polyethylene glycol fraction of all ethoxylated compounds not named as above is abbreviated as the acronym “PEG.” This combining form is followed by the average number of moles of ethylene oxide. When the ethoxylating agent is 2-chloroethanol, names are generally designated by the term “hydroxyethyl.” See Convention 39e.
- b. Polypropylene glycol is abbreviated as the acronym “PPG.” This combining form is followed by the average number of moles of propylene oxide, e.g., PPG-24 Butyl Ether. When the propoxylating agent is 2-chloropropanol, names are generally designated by the term “hydroxypropyl.” See Convention 39e.i and 39e.ii.
- c. Polyethylene imine is abbreviated as the acronym “PEI”. This combining form is followed by the average number of moles of ethylene imine (aziridine), e.g., Hydroxyethyl PEI-10.
- d. Homopolymers of ethylene glycol and propylene glycol are named as PEG-X and PPG-Y, respectively, with X or Y equal to the average total number of moles of alkoxyate in the material. Homopolymers of aziridine are named as PEI-X, with X equal to the average total number of moles of ethylene imine in the material.

- e. Alkoxyated esters are named as PEG and PPG derivatives; e.g., PPG-10 Stearate, PEG-40 Stearate. Mixed alkoxylation esters are named in the order of addition of the alkoxyating agent. An example of the random simultaneous addition of the alkoxyating agent is e.g., PEG/PPG-8/3 Diisostearate, PEG/PPG-10/2 Ricinoleate. An example of the ordered sequential addition of the alkoxyating agent is PEG-4 PPG-13 C13-15 Alcohol.
- f. PEG and PPG polymers or their derivatives in which one of the terminal primary alcoholic groups (CH<sub>2</sub>OH) has been oxidized to the carboxy group (-COOH), are named by adding the terms "carboxylic acid" or "carboxylate" to the parent name of the original polymer, e.g. Steareth-10 oxidized to carboxylic acid would be named Steareth-10 Carboxylic Acid.
- g. Poloxamers, Meroxapols, Poloxamines and Minoxapols are named in accordance with convention 6 above. The term "Poloxamer" denotes a block copolymer consisting of polypropylene glycol terminated with polyethylene glycol. The term "Meroxapol" denotes a block copolymer consisting of polyethylene glycol terminated with polypropylene glycol. The term "Poloxamine" denotes a block copolymer of ethylene diamine reacted first with polypropylene glycol and then polyethylene glycol, e.g., [(PEG)<sub>x</sub>-(PPG)<sub>y</sub>]<sub>2</sub>-NCH<sub>2</sub>CH<sub>2</sub>N-[(PPG)<sub>y</sub>-(PEG)<sub>x</sub>]<sub>2</sub>. "Minoxapol" is the reverse of "Poloxamine", e.g., [(PPG)<sub>x</sub>-(PEG)<sub>y</sub>]<sub>2</sub>-NCH<sub>2</sub>CH<sub>2</sub>N-[(PEG)<sub>y</sub>-(PPG)<sub>x</sub>]<sub>2</sub>. The numerical suffix designation is obtained by the following rule: The first two digits multiplied by 100 correspond to the approximate average molecular mass of the poly(oxypropylene) portion; the third digit multiplied by 10 corresponds to the percentage by weight of the poly(oxyethylene) portion.
- h. Block and random copolymers of polyethylene glycol and polypropylene glycol not named in 19g. are named as PEG-X/PPG-Y Copolymer (block), and PEG/PPG-X/Y (random) where X is the average ethoxylation value and Y is the average propoxylation value, e.g., PEG/PPG-240/60 Copolymer. The sequence (block or random) and the terminal groups are described in the monograph definition of each ingredient.
- i. Terpolymers with a center anchor, in which there is further block or random alkoxylation of an alkoxyated polymer, are named, for example, as PEI-y PEG-x/PPG-y Copolymer. (e.g., PEI-14 PEG-10/PPG-7 Copolymer)
- j. Ethoxylated glycerin is named as "Glycereth-x" where x denotes the average moles of ethylene oxide. Esters formed by the reaction of a fatty acid with an ethoxylated glycerin molecule are named by adding the suffix "ate" to the fatty acid grouping, e.g., Glycereth-5 Cocoate. When glycerin is derivatized prior to ethoxylation, (e.g., esterified with a fatty acid), the ethoylation is designated by PEG-x, e.g., PEG-7 Glyceryl Cocoate, PEG-3 Glyceryl Trioleate.

### **Alkyl Groupings**

20. The nomenclature for ingredients which are inherent mixtures (e.g., unfractionated fatty acids, or fatty alcohols from natural oils) is determined on the basis of the chemical identity of the raw material as purchased, (i.e., source and purity). Inherent mixtures that reflect the original distribution of components (i.e., when there is no fractionation) are named according to the common name of the source, e.g., Coconut Acid, Coconut Alkane, Soy Acid, Tallow Alcohol. Derivatives of these materials are named in a similar manner, e.g., Ammonium Palm Kernel Sulfate, PEG-5 Avocadoate, Tallowaminopropylamine. If the original natural distribution has been significantly cut or enriched, the mixture is named on the basis of the predominant component, e.g., Sodium Myreth-3 Sulfate. The predominant component is defined as one that is clearly present at the highest concentration in relation to the other components.
21. Nomenclature for materials that result from feedstocks that are mixtures, and where a single component does not predominate, (e.g., mixtures of fatty acids), is designated by the names

of the alkyl groups separated by a slash, e.g., Caprylic/Capric Glycerides, Glyceryl Isostearate/Myristate, Pentaerythrityl Stearate/Caprate/Caprylate/Adipate., Coconut/Palm Kernel Alkanes, Coco/Sunfloweramidopropyl Betaine, Palm/Stear/Behenamidoethyl Diethonium Hydrolyzed Wheat Protein. When a mixture is constituted by a broad range of alkyl groups, "C" type nomenclature is used to designate a name, e.g., C14-30 Alkyl Beeswax, C10-16 Alkyl Glucoside.

An exception to this convention is the historical usage of the terms "cetearyl" and "cetoleyl" to identify a feedstock mixture of cetyl/stearyl alcohol and cetyl/oleyl alcohol, respectively. Also, the term "vegetable" has been historically applied to a limited number of ingredient names, e.g., Vegetable Oil, Hydrogenated Vegetable Glycerides, Hydrolyzed Vegetable Protein, and their derivatives, and these names have been "grandfathered". Current conventions stipulate the identification of the specific oil source(s) in the name, see Convention 43a.

22. Materials containing mixtures of even-carbon, straight-chain length fractions in which there is a predominant component are named by the common name for the predominant fatty stem. Materials containing mixtures of even- and odd-carbon chain length fractions are designated by alternative nomenclature when there is not a predominant component, e.g., C12-15 Pareth-3. See Conventions 21 and 23.
23. The term "Pareth" applies to ethoxylated paraffinic alcohols containing both even- and odd-carbon chain length fractions, e.g., C12-15 Pareth-3.
24. Straight-chain alkyl groups are described by their common stem names. The following table describes the nomenclature applied to straight-chain acids and alcohols.

**Saturated:**

Chain Length	Acid	Alcohol
C6	Caproic	Hexyl
C7	Heptanoic	Heptyl
C8	Caprylic	Caprylyl
C9	Pelargonic	Nonyl
C10	Capric	Capryl
C11	Undecanoic	Undecyl
C12	Lauric	Lauryl
C13	Tridecanoic	Tridecyl
C14	Myristic	Myristyl
C15	Pentadecanoic	Pentadecyl
C16	Palmitic	Cetyl
C17	Margaric	Heptadecyl
C18	Stearic	Stearyl
C20	Arachidic	Arachidyl
C22	Behenic	Behenyl

**Unsaturated:**

Chain Length	Acid	Alcohol
C11	Undecylenic	Undecylenyl
C16	Palmitoleic	Palmitoleyl
C18	Oleic	Oleyl
C18	Linoleic	Linoleyl
C18	Linolenic	Linolenyl
C20	Arachidonic	Arachidonyl

C22	Erucic	Erucyl
C22	Cetoleic	Cetoleyl

25. Branched-chain alkyl groups have historically been described by the prefix “iso” followed by the common stem name for the comparable straight-chain group (e.g., Isostearyl Alcohol, Isocetyl Alcohol). The major exception to this rule is the nomenclature for the Guerbet alcohols. These materials are named chemically, e.g., Octyldodecanol, Decyltetradecanol. An additional exception is the name C10-40 Isoalkyl Acids which refers to the acids isolated from lanolin.
26. The following table has been included to clarify the nomenclature for derivatives of caproic, caprylic, and capric acids.

Chainlength	Stem Name	Acid	Ester
C6	Capro	Caproic	Caproate
C8	Capryl	Caprylic	Caprylate
C10	Capr	Capric	Caprate

  

Chainlength	Acyl	Alkyl	Ampho
C6	Caprooyl	Caproyl	Caproo
C8	Capryloyl	Caprylyl	Caprylo
C10	Caproyl	Capryl	Capro

### ***Amphoteric Compounds***

27. The term “ampho” has been used as a combining term in the nomenclature for amphoteric surfactants derived from imidazoline intermediates. In naming these compounds, “ampho” denotes N-hydroxyethyl ethylenediamine and is combined with the names for the substituent groupings, e.g., Sodium Cocoamphoacetate.

### ***Biological Materials***

28. Biological materials are named by a specific component (e.g., Hyaluronic Acid, Phosphatidyl Choline, Sphingosine) when the material has been isolated, purified and chemically characterized. General nomenclature for biological materials (e.g., Glycosaminoglycans, Fish Serum Extract) is utilized to name materials in accordance with the extent of their purification.
- Trivial names for biological compounds are generally utilized in INCI names rather than systematic nomenclature, e.g., lysine, melatonin, lecithin. Trivial names are also used for derivatives where possible, e.g., N-Feruloyl Serotonin, N-Nicotinoyl Dopamine, Palmitoyl Arginine. See also Convention 3.
  - Ingredients derived from human tissue contain “human” as part of the INCI name, e.g., Human Umbilical Extract. See also Convention 60g and 60h.
  - Materials derived from animal sources are named by the common name of the animal, rather than the genus/species of the animal, e.g., Donkey Milk. Genus/species information may be included in the definition. For mammalian derived cells, the name of the organ will be used unless a specific cell type has been isolated, e.g., Liver Cell Extract, Leukocyte Extract, Human Keratinocytes,
  - INCI names for fungi are identified by genus and species, e.g. Mucor Circinelloides Oil,

Ganoderma Lucidum (Mushroom) Extract. Historically, the term “mushroom” is also included in the relevant INCI names since it is a term recognized by the consumer.

- e. Yeast has historical usage as an INCI name and is a grandfathered term. Products derived by yeast fermentation are named by the genus term “Saccharomyces” (see Convention 29b.)
- f. Extracts of algae have historically been named as Algae Extract, in addition to being named by genus terms, e.g., Ascophyllum, Laminaria, etc. These names are grandfathered; the current naming practice is to include both the genus and species terms in the name. The INCI name “Plankton” is also a grandfathered term, and the current practice is to also identify these materials by genus/species.

### ***Biotechnological Materials and Ferments***

29. Generally speaking, Biotechnology involves the usage of microorganisms, or single cells in culture, in the industrial production of a material. (See also Synthetic Peptides, Convention 56 h-k, for the nomenclature of peptides derived by recombinant technology.) Biotechnological materials are substances derived by the action of microorganisms, such as bacteria or yeasts, on a substrate to produce materials by fermentation, metabolism, hydrolysis, lysis, or other process. The process may involve the use of nutrients and other materials such as enzymes. The resulting product is referred to as a “culture” or “ferment.” The “ferment” may be further processed by extraction, filtration, or other procedure to yield the final product. The conventions used to provide INCI Names for biotechnological materials are as follows:

- a. When the end product produced from a given “ferment” or “culture” has a common or usual name, such name may be used, e.g., Yogurt, Gellan Gum, Xanthan Gum, Wine.
- b. When the end product does not have a common or usual name, the product will be named using the genus of the microorganism followed by a slash and the name of the substrate (if applicable) followed by the word “ferment.” On a case-by-case basis, the genus and species name of the microorganism may be used when the use of the genus only may be misleading and the species is needed for clarity, particularly where pathogenic organisms are involved, e.g., Candida Bombicola Ferment, Escherichia Coli/Glucose Ferment Filtrate, Bifida/Enterococcus Faecium/Lactobacillus/Streptococcus Thermophilus/Soymilk Ferment Curd.<sup>1</sup> Substrates will be identified by their common, usual, or other technical name, e.g., Lactococcus/Carrot Ferment. In the absence of a common name, the substrate may be named by the Latin genus/species term, e.g., Aspergillus/Camellia Sinensis Leaf Extract Ferment.
- c. If the selected components of the ferment have been isolated and purified to a significant extent and analytical evidence is provided, the name for one or more of the components may be used, e.g., Glycosphingolipids, Beta-Glucan, Dextran, Sodium Hyaluronate.
- d. Products derived by fermentation and further processed by extraction or filtration are named accordingly, e.g., Lactobacillus/Oat Ferment Extract Filtrate. When cells are lysed by mechanical means, use of chemicals, enzymes, or heat treatment, the term “lysate” is included in the name, e.g., Lactobacillus Ferment Lysate.
- e. Conditioned Media is the growth media collected from eukaryotic cell cultures and are named according to the source of cells being cultured, e.g., Human Cord Blood Cell Conditioned Media, Camellia Sinensis Callus Culture Conditioned Media. No distinction

---

<sup>1</sup> The FDA Bad Bug Book is often used as a reference for foodborne pathogenic organisms.

is made regarding the growth conditions or manufacturing method, (e.g., cells grown under hypoxia or induced by ozone).

- f. Ingredients derived by plant tissue culture are named according to their method of production as follows:
  - i. "Plant Callus Extract" is an extract of a callus, or any plant cells that are forced to go through a callus stage in culture unless re-differentiated, (see ix. below)
  - ii. "Plant Callus Extract Powder" is an extract of callus cells which have been dried, and ground
  - iii. "Plant Callus Culture Extract" is an extract of a whole culture (cell + media) of callus cells.
  - iv. "Plant Callus Powder" is a callus (or callus cells), that has been dried and ground without extraction.
  - v. "Plant Cell Culture" is a cell suspension obtained using high shear and enzymatic treatment and without a callus formation.
  - vi. "Plant Cell Culture Extract" is the extract of a whole cell suspension culture (cell + media).
  - vii. "Plant Cell Culture Conditioned Media" is the isolated conditioned media from a Plant Cell Culture.
  - viii. "Plant Cell Extract" is an extract of the cells (without the media).
  - ix. Callus cells which are caused to differentiate into a specific plant part after callus formation are named by the plant part rather than callus term.
- g. When the material is derived from a microorganism culture (with no additive), the name will consist of the genus and/or species term followed by the relevant term to indicate post-fermentation processing, (e.g., *Lactobacillus* Ferment Filtrate.)
- h. Products derived by spontaneous fermentation (i.e., where a microorganism is not utilized) are named on the basis of the material being fermented followed by the relevant term to indicate post-fermentation processing, (e.g., *Sapindus Mukorossi* Fruit Ferment Extract). The definitions for these ingredients indicate that the fermentation occurs spontaneously.

## **Botanicals**

- 30. Botanicals are cosmetic ingredients directly derived from plants. Generally, these ingredients have not undergone chemical modification and include extracts, juices, waters, distillates, powders, oils, waxes, saps, tars, gums, unsaponifiables, and resins. Where evidence of isolation is presented, a botanical ingredient may be named as a chemical entity, e.g., Genistein, or other appropriate terminology, e.g., Soy Isoflavones, depending on the extent of isolation.
  - a. The INCI names for botanicals are based on the Linné system or Latin binomial, whereby the Genus and species of the plant is used. When several materials relate to the same Genus/species, the name for the variety or the sub-species may be added to the Genus/species name.
  - b. If an ingredient is derived from a botanical hybrid with no recognized Linnean name, the INCI name will reflect the Linnean names of both plants used to create the hybrid separated by a slash, e.g. *Rubus Fruticosus/Idaeus* Extract.
  - c. Historically, the primary reference used by the INC to establish the Latin binomial names for botanicals was Penso, G., *Index Plantarum Medicinalium Totius Mundi Eorumque Synonymorum*, O.E.M.F. Milano (1983) - ISBN No. 88-7076-027-8.



- d. Current sources utilized to verify botanical nomenclature include:
- United States Department of Agriculture Germplasm Resources Information Network (GRIN): <http://www.ars-grin.gov/cgi-bin/npgs/html/taxecon.pl>
  - United States Department of Agriculture Plants Database: <http://plants.usda.gov/>
  - UniProt Taxonomy: <http://www.uniprot.org/taxonomy/>
  - Encyclopedia of Life: <http://eol.org/>
  - AlgaeBase: <http://www.algaebase.org/>
  - The International Plant Names Index: <http://www.uk.ipni.org/ipni/plantnamesearchpage.do>
  - Integrated Taxonomic Information Systems: <http://www.itis.gov/>
  - Missouri Botanical Garden: <http://www.tropicos.org/>
  - eFloras: <http://www.efloras.org/>
- e. INCI names for botanicals include the part(s) of the plant from which the material is derived. When more than one part is utilized, the plant parts are listed in alphabetical order, separated by a slash. When the material is derived from the entire plant, no part is specified and the material is defined as being from the whole plant.
- f. The INCI names for plant extracts prepared by solvent extraction are assigned labeling names that identify the name of the plant and the solvent. When the extraction solvent is carbon dioxide, carbon dioxide is not included in the INCI name since it evaporates. Additionally, solvents are not identified in the INCI name in cases where the solvent has been driven off and not present in the final preparation. See Labeling Reminders, No. 4 in the Introduction.
- g. Essential oils prepared by a steam distillation process yields two distinct fractions, a water-insoluble fraction and a water-soluble fraction. The water-insoluble fraction contains the term oil in the name, e.g., Eucalyptus Globulus Leaf Oil. The water-soluble fraction contains water in the name, e.g., Camellia Japonica Leaf Water. When an ingredient is prepared by adding water to a material prepared by solvent extraction, the ingredient is named as a mixture, e.g., Water (and) Juniperus Communis Fruit Extract.
- h. The term “powder” is applied to the names for botanical materials that have been mechanically ground, irrespective of particle size. The term “meal” and “flour” are commonly recognized consumer terms, and are utilized accordingly in names such as Corn Cob Meal, Soybean Flour, etc.
- i. Where several botanical materials are combined before processing, e.g., extraction or distillation, the ingredient is named by the genus, species and part of each plant separated by a slash followed by the preparation term, e.g., Aesculus Hippocastanum Bark/ Daucus Carota Root/Foeniculum Vulgare Fruit Extract. Exceptions to this convention are the INCI names Rose Extract and Rose Flower Oil which have historical usage and are grandfathered; along with Camellia Seed Oil defined as the oil expressed from one or more species of *Camellia* and named in accordance with information obtained from JCIA.
- j. The term “soybean” has historical usage in INCI names to describe both *Glycine soja* and *Glycine max*.
- k. Botanicals are named by a specific component, e.g., Apigenin, Isoquercetin, when the material has been isolated, purified and chemically characterized. General nomenclature for botanicals (e.g., Soy Isoflavones, Hydrolyzed Ginseng Saponin, Cassia Angustifolia

Seed Polysaccharide) is utilized to name materials in accordance with the extent of their purification. See 54d for Conventions related to optical isomers.

- l. Gums of natural origin are designated by common name that identifies the source, e.g., Acacia Senegal Gum, Ghatti Gum, Natto Gum. Common names for gums derived by fermentation include Gellan Gum, Xanthan Gum. Ingredients derived by reaction with a gum generally do not include the term “gum” in the INCI name, e.g., Hydroxypropyl Guar.
  - m. Ingredients derived from plant tissue culture are named in accordance with their process; the naming principles are fully described in Biotechnological Materials and Ferments, 29f.
31. Harmonized INCI names for botanicals are designated by the Latin binomial as determined above, followed by the common name (where historically used) in parentheses, followed by the plant part (if applicable) and the type of preparation, e.g., *Prunus Persica* (Peach) Leaf Extract.

In general, Latin binomial names are not used for botanicals that have been chemically modified. Botanicals that have a widely recognized common name (e.g., Olive Oil), and have undergone chemical modification may be named by common name and type of process, e.g., Acetylated Castor Oil, Hydrogenated Rapeseed Glycerides, Hydrolyzed Corn Starch, Oxidized Hazel Seed Oil, Ozonized Olive Oil, *Saccharomyces*/Grape Ferment Extract. In the absence of a previously monographed common name, or common name not widely known, the genus/species name may be utilized to name derivatives, e.g., *Schinziophyton Rautanenii* Oil Polyglyceryl-6 Esters.

In the EU, botanicals are named by the Latin binomial as explained above, followed by the plant part (if applicable) and type of preparation, e.g., *Prunus Persica* Leaf Extract. (See the discussions on International Harmonization, and Botanicals in the Introduction.)

When several materials relate to the same genus/species are used, the variety or sub-species in the Linné system may be identified, e.g., *Citrus aurantium dulcis*, *Citrus aurantium amara*.

There are a few cosmetic ingredients of herbal medicine origin in Japan in which the medicinal effect of the plant is specific to the sub-species. For these ingredients, the sub-species is included in the name, e.g., *Coix Lacryma-Jobi* Ma-Yuen Seed, *Coix Lacryma-Jobi* Ma-Yuen Seed Oil.

32. The INCI names for extracts represent the “material extracted”; the extracting solvents and/or diluents if any, present in the specific trade name material is listed in the Technical/Trade Names/INCI Names Section. The trade name material is named by listing each component of the mixture, as identified under its trade name in the Technical/Tradenames/INCI Names Section, in descending order of predominance.

## **Ceramides**

33. The term ceramide as part of an INCI is assigned to those classes and structures of natural lipids derived from skin as reported by Philip W. Wertz, Ph.D., Marion C. Miethke, M.D., Sherri A. Long, M.D., John M. Strauss, M.D., and Donald T. Downing, Ph.D., “The composition of ceramides from human stratum corneum and from comedones,” *The Journal of Investigative Dermatology*, 84 410-412 (1985). The term “ceramide” is also utilized in accordance with the naming system proposed by Motta, S., et al (1993) *Biochimica et Biophysica Acta*, 1182, 147-151.

- a. A synthetic N-acylated sphingoid base that is identical to any one of the many constituents of the natural ceramides, as reported by Wertz, is assigned an INCI labeling name in accordance with the Wertz system, e.g., Ceramide 1, Ceramide 1A, Ceramide 2, Ceramide 3, Ceramide 4, Ceramide 5, Ceramide 6II. The term ceramide as part of the INCI name will be assigned to a N-acylated sphingoid base that contains, as the predominant component, the D-erythro isomer of at least one of the many natural ceramides described by Wertz. A predominant component is one that is present at the highest concentration in relation to other synthetic materials of similar structure and related compositions present in a mixture. The Motta system for naming ceramides is also incorporated into INCI nomenclature. The Motta system utilizes a series of acronyms to designate the various fatty acid/sphingoid base combinations. The sphingoid base is typically 6-hydroxy sphingosine, phytosphingosine, sphinganine or sphingosine, and the fatty acid can be saturated or unsaturated, and normal, or contain an alpha- or omega-hydroxyl grouping. Ceramides containing an omega-hydroxy fatty acid can exist in the free form or be esterified with either linoleic acid or a mixture of predominantly linoleic acid in combination with oleic acid and stearic acid. A number of different combinations of fatty acid/sphingoid base exist which give rise to a variety of INCI names, e.g., Ceramide NS, Ceramide EOS, etc. The chart below identifies the acronyms used in Motta-based ceramide nomenclature:

N	normal fatty acid
A	alpha-hydroxy fatty acid
O	omega-hydroxy fatty acid
E	esterified omega-hydroxy fatty acid
S	sphingosine base
P	phytosphingosine base
H	6-hydroxysphingosine base
G	sphinganine base

- b. Synthetic N-acylated sphingoid bases that do not have the D-erythro configuration, or otherwise are not constituents of natural ceramides as described by Wertz or Motta, will not be named using the term ceramide. In such cases, a chemical, or other appropriate name, to be determined by the International Nomenclature Committee (INC) on a case-by-case basis, will be assigned as the INCI labeling name. The INC may accept a signed statement by a person requesting the assignment of an INCI name that a synthetic N-acylated sphingoid base is the D-erythro isomer and otherwise conforms in composition to the above criteria.

### **Colorants**

- 34 a. Color additives permitted for products to be marketed in the United States are identified in Title 21 of the *U.S. Code of Federal Regulations* (21 CFR). The INCI Names for color additives subject to batch certification are abbreviated names as identified in the *Federal Register* on June 6, 1985 (50 FR 23815). The abbreviated labeling names do not include "FD&C" or "D&C," "No.," or the type of lake "Aluminum, Zirconium, etc.," on their product labels, e.g., Blue 1 Lake is the INCI name for the batch certified colorant FD&C Blue No. 1 Aluminum Lake.
- b. For U.S. FDA batch certified colorants, additional names have been added as synonyms in order to identify the non-certified commodity, e.g. Pigment Red 57 instead of Red 7.
- c. Alternative Color Index (CI) names have been established for those colorants appearing in Annex IV of *Regulation (EC) No 1223/2009* on cosmetic products and are

required to be used on products labeled for the European Union.

- d. Alternate INCI names have been established for synthetic organic colorants permitted in Japan, regulated by the Ordinance to Regulate Coal-Tar Colors Permitted for Use in Drugs, Quasi-drugs, and Cosmetics (MHLW Ordinance No. 30 of August 31, 1966 as amended by MHLW Ordinance No. 55 of December 13, 1972, by MHLW Ordinance No.1126 of July 29, 2003 and by MHLW Ordinance No. 59 of May 2004.
  - e. Coated pigments are named as blends, e.g., Polyethylene Terephthalate (and) Aluminum Powder. Epoxy Resin Coated Aluminum Powder is contained in the Dictionary as one of the Japan Trivial Names.
35. Oxidative hair coloring intermediates are named as described in 21 CFR. Those intermediates not appearing in 21 CFR are named according to their chemical structure.
36. Preformed hair colors are named as described in 21 CFR. Those preformed hair colors not appearing in 21 CFR are given the Colour Index Name. Preformed hair colors not appearing in either 21 CFR or the Colour Index are assigned chemical names based on their structure. In the event that the chemical name is very complex, these colors are assigned an arbitrary color/number designation, prefixed by the letters "HC."

### ***Denatured Alcohol***

- 37 a. Specially Denatured (SD) Alcohols used in products marketed in the United States are named in compliance with Title 27 of the *U.S. Code of Federal Regulations* (27 CFR). The denaturants used in the manufacture of each SD Alcohol formula are specified in the monograph in Section 1. Manufacturers using these SD Alcohols should consult 27 CFR and the *Federal Register* for permitted uses, restrictions and proposed changes.
- b. An alternate INCI name, Alcohol Denat., has been established for products marketed in European Union (EU) Member States. Alcohol Denat. is ethyl alcohol that is denatured in accordance with the national legislation of each EU Member State. The INCI Name Alcohol Denat. may also be used in the United States for ethyl alcohol denatured in accordance with 27 CFR. For additional information see "Regulatory and Ingredient Use Information," Introduction, Part A.

### ***Glycerides***

- 38 a. The term "Glyceride" has been utilized to describe a monoglyceride. (e.g., Acetylated Lard Glyceride, Canola Oil Glyceride, C10-40 Isoalkyl Acid Glyceride, Palm Glyceride.)
- b. The term "Glycerides" is used to designate mixtures of mono-, di- and/or triglycerides, (e.g., Acetylated Palm Kernel Glycerides, Caprylic/Capric Glycerides, Corn Glycerides, Isostearic/Myristic Glycerides, PEG-12 Palm Kernel Glycerides.)
- c. Triglycerides are designated by the term "triglyceride", (e.g., C10-40 Isoalkyl Acid Triglyceride.) Alternate nomenclature is utilized when triglycerides are formed utilizing a single fatty acid, (e.g., Trilaurin, Trimyristin, Tristearin.)

### ***Glycols***

- 39 a. Glycol is the INCI name for ethylene glycol, and is used as a combining term for

derivatives of ethylene glycol, e.g., Glycol Distearate, Glycol Salicylate.

Alkylene 1,2-diols are named by the common name of the alkyl group followed by the term glycol, e.g., Lauryl Glycol. See Convention 44f for the naming of polyethylene glycol.

- b. Diglycol is the INCI name for diethylene glycol, and is used as a combining term for derivatives of diethylene glycol, e.g., Ethoxydiglycol, Diglycol/Isophthalates/SIP Copolymer. See also 39c.
- c. PEG-2 is the INCI name for diethylene glycol when the reaction mechanism occurs through the use of an average of 2 moles of ethylene oxide. The exception to this principle is the usage of the suffix “-eth-2” to describe a 2-mole ethoxylate of a fatty alcohol, (see Convention 18a).
- d. Butylene glycol is the INCI name for 1,3-butanediol. The numbers are omitted from the INCI name for the parent compound and its derivative, e.g., Butylene Glycol Myristate. INCI names for all other configurations include the numerical prefix to specify the position of the hydroxyl groups, e.g., 1,2-Butanediol, 2,3-Butanediol, 1,4-Butanediol, PEG/Poly(1,2-Butanediol)-52/32 Dimethyl Ether, 1,4-Butanediol Bisdecanoate. See also Convention 4.
- e. “Propylene Glycol” is used as a combining term in INCI names when it is a starting material, e.g., Propylene Glycol Behenate, Dipropylene Glycol Caprylate, Tripropylene Glycol Citrate.
  - i. “-PG” or “PG-” is used in INCI names when the starting material is glycidol.
  - ii. “Hydroxypropyl” refers to 2-hydroxypropyl or 3-hydroxypropyl (e.g., Guar Hydroxypropyltrimonium Chloride), and is used when the starting materials are possibly 1-chloroisopropanol or 1-aminoisopropanol, or 3-chloropropanol or 3-aminopropanol. (See also Convention 19b)

### **Imidazolines**

- 40. Common fatty stem terms are used to designate the alkyl portion of alkyl imidazoline compounds (e.g., Lauryl Hydroxyethyl Imidazoline) even though one carbon atom of the fatty radical becomes a member of the heterocyclic ring during the materials' manufacture.

### **Lanolin Derivatives**

- 41. Names of lanolin derivatives usually contain the stem “lan”, e.g., Laneth-10 Acetate. When fractionated, derivatives are named utilizing “lan” as a stem name unless a specific component has been isolated, e.g., Cholesterol.

### **Minerals**

- 42 a. Naturally occurring minerals with a definite chemical composition and/or physical properties (which may include x-ray diffraction data) are named according to the nomenclature established in published mineralogy texts and internet sources, including but not limited to:
  - Cornelis Klein and Cornelius S. Hurlbut, Jr., *Manual of Mineralogy* (after James D. Dana), Twenty-First Edition (1985), John Wiley & Sons, Inc., New York.
  - Carmichael, Robert S., *CRC Practical Handbook of Physical Properties of*

- *Rocks and Minerals*, (1989), CRC Press, Inc., Boca Roton, FL 33431.
- Schumann, Walter, *Gemstones of the World*, (1997), Sterling Publishing Co., Inc., New York.
- [www.mindat.org](http://www.mindat.org)
- <http://minerals.usgs.gov/>

- b. Naturally occurring materials that are mixtures of mineral species are named on the basis of particle size using common names such as sand, clay, silt, and other similar terms.

When the composition of a raw material, along with its properties and source are properly documented and supported in literature, the material may be named according to its geographical origin, e.g., Moroccan Lava Clay, Heilmoor Clay.

- c. The term “synthetic” is applied to the names of inorganic materials such as rocks, gems, and minerals, (e.g., Synthetic Ruby) to indicate that the material is synthesized. These materials, while generally physically indistinguishable from their natural counterparts, are chemically similar but may vary in chemical composition. Bureau of Standards and X-ray diffraction pattern data must be supplied to support the characterization of compositional similarities between natural and synthetic materials.
- d. Rocks, gems and minerals that are mechanically ground (i.e., not ground by natural processes) are named by the common geological term followed by the term “powder”, (e.g., Ruby Powder).
- e. Doped minerals obtained via calcination are considered solid solutions and are named as a single entity by the constituent mineral oxides, e.g., Silicon/ Titanium/Cerium/Zinc Oxides.
- f. Mineral extracts are designated by the name of the mineral and the term “extract”, e.g., Loess Extract, Lignite Extract, Malachite Extract, when the manufacturing information indicates the mineral is extracted.
- g. Allotropes of carbon are named according to their structural form, e.g., Diamond, Graphite, Fullerenes, Carbon.
- h. Plant Ash is the name designated for ingredients composed of ash produced by the combustion of any plant material or mixture of plants.
- i. Carbonaceous material obtained by heating wood or other organic matter in the absence of oxygen is named as Charcoal.
- j. Clays have historically been designated INCI names based on geographic region; these names have been “grandfathered”, e.g., Heilmoor Clay. The current naming practice is to designate clay material by the INCI name, “Clay”.
- k. Loose pieces of minerals and rocks are sediment and further characterized by particle size as follows:
  - i. Sand is a naturally occurring granular material composed of finely divided rock and mineral particles based on silica in the form of quartz, with a typical particle size between 0.0625 to 2.00 mm.
  - ii. Silt is sediment from inland bodies of water. It is a naturally occurring inorganic material whose origins are based on quartz and feldspar with typical particle sizes between 0.0625 to 0.00400 mm, e.g., Sea Silt.
  - iii. Mud is a mixture of water and some combination of soil, silt, and clay, e.g.,

Alluvial Mud, Salt Mine Mud.

- i. Volcanic Soil is a mixture of minerals derived from volcanic deposits which are of varying size including but not limited to sand, silt and clay. Volcanic Sand is loose, granular particles of disintegrated lava deposits. Volcanic ash is the residue obtained from volcanic eruption.
- m. Glass is an amorphous inorganic material based on silica ( $\text{SiO}_2$ ) that is combined with various additives, usually metal oxides (e.g., sodium oxide, calcium oxide, magnesium oxide). Glasses are produced by fusing silica together with the additives, then rapidly cooling to eliminate formation of a crystalline structure.

### ***Oils, Fats, Lipids and Triglycerides***

- 43. a. Triglycerides of plant or animal origin that are liquid at room temperature are generally known as fixed oils and are named by their source followed by the term oil, e.g., Olea Europea (Olive) Oil, Elaeis Guineensis (Palm) Oil, Elaeis Guineensis (Palm) Kernel Oil, Canola Oil, Cod Liver Oil. Oils which have been chemically modified by acetylation, hydrogenation, isomerization or oxidation are named in a similar fashion, e.g., Acetylated Castor Oil, Hydrogenated Palm Kernel Oil, Isomerized Palm Oil, Oxidized Corn Oil, (see Convention 31.)
- b. Triglycerides of animal origin that are solid at room temperature are generally known as fats, and are named by their source followed by the term fat e.g., Deer Fat, Goat Fat, Buffalo Fat.
- c. Essential oils that are water insoluble fractions of plant materials obtained by steam distillation are named by their source followed by the term oil, e.g., Rose Flower Oil, Salvia Officinalis (Sage) Oil. Water soluble fractions of essential oils are named as waters, (see Convention 30g.)
- d. The term "oil" may be used to name non-triglycerides when it applies to ingredients that are commonly recognized, (e.g., Simmondsia Chinensis (Jojoba) Oil, Lanolin Oil, Mineral Oil, Tall Oil, Tar Oil.)
- e. Plant butters derived by mechanically pressing the seeds are generally semi-solids at room temperature and are named by the genus/species term of the plant in accordance with Convention 30, e.g., Garcinia Indica Seed Butter. Exceptions include the common name "Butter" which refers to the fat recovered from cow's milk, and "Goat Butter" which refers to the fat recovered from goat's milk.
- i. Lipids isolated from plant or animal origin are named by the common name of the animal, e.g., Shark Lipids, Silkworm Lipids, or genus/species name of the plant, e.g., Oryza Sativa (Rice) Lipids. See also Convention 33, Ceramides.

### ***Polymers***

- 44. Polymeric materials are named according to the name in common usage if it is well known, or by the structure if well-defined, e.g., polyethylene terephthalate. Typically, polymers are named by the starting monomer instead of the composition of the final polymer, e.g., Polydecene instead of polydecane. Exceptions include copolymers named with vinyl alcohol as one of the monomers, e.g., Sodium MA/Vinyl Alcohol Copolymer, in which the starting monomer, vinyl acetate is hydrolyzed to form the alcohol. If no common name exists, and the structure is not well-defined, the polymers are named according to

their composition as described below.

- a. Homopolymers (consisting of one constituent monomer) are named by placing the term “poly” before the constituent monomer, e.g., Polyisobutene.
  - b. Copolymers consisting of two or more constituent monomers are named by listing the monomers in alphabetical order separated by a slash (/) followed by the word “Copolymer,” e.g., Acrylates/Acrylamide Copolymer.
  - c. Copolymers consisting of four or more monomers may be given an INCI name according to the predominant monomer, or resultant polymer class followed by an arbitrary number, e.g., Polyester-1, Polyquaternium-1, etc., with the monomers listed in the monograph definition in alphabetical order of the material. Copolymers with less than four monomers and with an excessive name length may also be considered for “poly-type” names as described above. Such nomenclature is granted at the discretion of the INC.
  - d. Crosspolymers consisting of two or more constituent monomers are named by listing the monomers in alphabetical order separated by a slash (/) followed by the word “Crosspolymer,” e.g., Acrylates/VA Crosspolymer.
    - i. The crosslinking agent will be included in the INCI name if the crosslinking agent is a polymer. In these cases, the crosslinking agent will appear as the last component of the INCI name followed by the word “Crosspolymer”; e.g., Lauryl Dimethicone/PEG-15 Crosspolymer, where the crosslinker is diallyl PEG-15.
    - ii. When the crosslinking agent is not a polymer, it will not be included in the INCI name, but will be included in the monograph definition of the material, e.g., Acrylic Acid/Isopropylacrylamide/ MIBK Acrylamide Crosspolymer-is a copolymer of acrylic acid, isopropylacrylamide, methyl isobutyl ketone (MIBK) acrylamide crosslinked with methylene bis-propenamide. Carbomer is an exception to this Convention because of its historic usage.
    - iii. Although the generic naming for polymers described in Convention 44c takes precedence, crosslinking monomers are included in the INCI name when the crosslinking monomer is essential to the formation of the polymer repeating structure, e.g., the inclusion of citric acid in Behenyl/Octyldodecyl Propanediol Citrate Crosspolymer.
45. The term “Acrylates” is used to describe linear, non-crosslinked copolymers that contain combinations of acrylic acid, methacrylic acid, and their simple esters. They are described as simple alkyls ranging from C1 to C4 (linear or branched). Similarly, the term “Crotonates” is used to describe copolymers that contain combinations of crotonic acid and its simple esters.
46. The term “Aminoacrylates” refers to simple aminoacrylates, in which the substituted alkyl groups attached to amino nitrogen range from C1-4, and acrylates conforms to the definition as described above.
47. The name “Carbomer” is used to describe high molecular weight crosslinked homopolymers of acrylic acid. The crosslinking agent(s) are identified in the ingredient monograph definition.
48. A “Dendrimer” polymer is named from the core to the outside by the monomer layers. If a monomer unit is repeated, the number of generations or layers is indicated. If a previous convention exists for naming the core, then it is utilized. An example is PEG-5 Pentaerythrityl



(the core) Dimethylol (the layer) Propionate-2 (generations) in which there are 5 repeating units of polyethylene glycol attached to pentaerythritol as the core. Dimethylol propionic acid is reacted to the core for two generations.

A dendron attached to a polymer backbone is named by the backbone polymer with the added dendron side group described, e.g., Acrylates/HEMA Copolymer (the core) Dimethylol Propionate-4 (the layer and generation) Dendron.

49. The term Polyurea is used to name polymers typically formed by the condensation of a diisocyanate with a diamine.

### ***Prostaglandin Derivatives***

50. Ingredients which are analogues of prostaglandin compounds utilize the drug stem term as part of the corresponding cosmetic ingredient name, e.g., Bimatoprost and Cyclopropylbimatoprost; Cloprostenol and Isopropyl Cloprostenate; Noralfaprostol and Isopropyl Dihydro Noralfaprostal; Travoprost and Ethyl Travoprostamide. The use of common drug stem names for related cosmetic substances is considered by the INC on a case-by-case basis.

### ***Quaternary Ammonium Salts***

51. Quaternary ammonium salts usually have the suffix "ium" in the stem of the cation. The term "monium" describes a monomethyl-substituted quaternary nitrogen; "dimonium" describes a dimethyl-substituted quaternary nitrogen; "trimonium" describes a trimethylsubstituted quaternary nitrogen.

### ***Silanes and Siloxanes***

52. Silanes and Siloxanes are named according to the following subcategories:
- Silanes are monomeric compounds containing one silicon atom, or two or more silicon atoms bonded directly to each other. Silanes are named by listing substituents in alphabetical order, and then the term 'silane' with the appropriate numerical prefix, e.g., Dimethyldisilane.
  - Silanols [silanes containing hydroxyl group(s)] are named according to the number of hydroxyl groups attached to the silicon atom, e.g., silanediol, silanetriol.
  - Hydroxyl group(s) occurs in the terminal position of a polysiloxane are named as Methiconol or Dimethiconol, see 52f.
  - Cyclic dimethyl siloxane was historically named 'Cyclomethicone' to represent mixtures of species containing three to seven siloxane units. For pure components (>99%), the nomenclature is based upon the number of siloxane units, cyclotrisiloxane, cyclo-tetracyclosiloxane, cyclopentasiloxane, and cycloheptasiloxane.
  - Linear polysiloxanes (trimethylsiloxy end-blocked) are named as derivatives of methicone or dimethicone, and when containing 2-4 silicon atoms are they are named chemically (e.g., Trisiloxane, Disiloxane).
  - Methicone refers to linear siloxane polymers where each silicon atom in the siloxane chain has one methyl group and one hydrogen atom. Dimethicone is the name for siloxane polymers where each silicon atom has two methyl groups. Methicone is often the starting material for making alkyl siloxanes where the hydrogen atoms are replaced

with the alkyl group (e.g. C26-28 Alkyl Methicone). Dimethicones that have some of the methyl groups replaced by other substituents are named accordingly, e.g. Stearyl Dimethicone, PEG-12 Dimethicone, Phenyl Dimethicone. Methicones and Dimethicones normally have methyl groups on the ends of the siloxane chains. When the siloxane chains are terminated by other groups, these are included in the name with the prefix “Bis-“, e.g. Bis-Aminopropyl Dimethicone, Bis-Hydrogen Dimethicone, Bis-PEG-8 Dimethicone

- g. Silsesquioxanes are highly branched siloxanes that conform to the general formula  $[\text{RSiO}_{3/2}]_x$ , where R is an organic substituent. They are sometimes referred to as Polyhedral Oligomeric Silsesquioxanes (POSS). They are named as polysilsesquioxanes with the name of the substituent included, e.g. Polyphenylsilsesquioxane, Polypropylsilsesquioxane. When the silsesquioxane is copolymerized with other siloxanes, the substituent is not named when it is methyl. Other types of substituents are included in the name, e.g. Dimethicone/Silsesquioxane Copolymer, Amodimethicone/Morpholinomethyl Silsesquioxane Copolymer.
- h. Silicates are named as such, with any substituents and/or terminal groups appropriately named, e.g., Trimethylsiloxysilicate.
- i. The term ‘Polysilicone’ followed by an arbitrary number is used to describe complex silicone polymers that cannot be named by common names or established conventions for silicone compounds (e.g., Polysilicone-10).

### ***Substituted Compounds and Prefix/Suffix Terms***

53. Singly substituted derivatives usually do not include the prefix “mono.” This term is used only when required to prevent ambiguity. The absence of a suitable prefix implies “mono,” e.g., Glyceryl Stearate represents glyceryl monostearate, and Glyceryl Oleate/Laurate represents a monoester of glycerin with a blend of oleic and lauric acids.)
54. Multiple substitution is routinely described with the appropriate prefix, such as “di-,” “tri-,” or “tetra-“ e.g., Glyceryl Distearate, Propylene Glycol Dilaurate, Pentaerythrityl Tetrabenzoate.
  - a. Where there is substitution with a mixture of components, i.e., alkyl groups, the prefix is used only once, wherever possible, and the moieties are separated by a slash, e.g., Ditrimehtylolpropane Tetraistearate/ Hydroxystearate to denote the tetraester of ditrimethylolpropane and a mixture of isostearic and hydroxystearic acids.
  - b. The simple numerical prefixes “di-“, “tri-“, “tetra-“ etc. are used to indicate a multiplicity of simple (i.e., unsubstituted) substituents provided that there is no ambiguity, e.g., Propylene Glycol Dilaurate, Triethyl Citrate.
  - c. The numerical prefixes “bis”-, “tris-“are generally utilized to denote multiple identical structural features of a compound, e.g., Tris-Biphenyl Triazine, Bis-Aminopropyl Dimethicone.
  - d. Optical isomers are usually not designated in INCI names although this information may

be included in the monograph definition. However, there may be circumstances whereby it is necessary to identify the optical properties of the isomer, e.g., d-limonene under EU regulation 111/1.88, and the INC will address these situations as they arise.

- e. The numbering of substituents is only employed where necessary to prevent ambiguity, e.g., 1,4-Butanediol, 2,3-Butanediol.
  - f. The prefixes *o*-, *m*-, *p*-, *t*-, *n*-, N, N', etc. are used only when necessary to prevent ambiguity.
  - g. Locants are included in the INCI name when there is more than one possible site for the reaction. e.g., N-Feruloyl Dopamine
55. Mixtures of mono-, di- and tri-esters of glycerin are designated by the suffix “-ates”, (e.g., Glyceryl Stearates.)
56. The dimethyl term is omitted and is assumed in all alkyl dimethyl amine oxide names (e.g., Stearamine Oxide). Tertiary amine oxides with different substituent groups are named completely (e.g., Dihydroxyethyl Stearamine Oxide).
57. Amino acids substituted on nitrogen are named by the identity of the substituent group and the trivial name of the amino acid. Since N-2 is the atom most easily modified, N-can be omitted from the name without ambiguity, e.g., Acetyl Tyrosine.
- a. The suffix “ate” is added to the amino acid name when the substance is a salt, e.g., Sodium Glutamate, Potassium Aspartate, or an ester, e.g., Ethyl Glutamate, Acetylated Cetyl Hydroxyproline, Methyl Undecenoyl Leucinate.
  - b. When the hydroxyl group of the carboxyl has been replaced by an amino group, the “amide” suffix is added to the trivial name of the amino acid, e.g., Hexacarboxymethyl Lysine, Lysine, Hydroxyphenyl Glycinamide, Prolinamidoethyl Imidazole.
  - c. When amino acids are derivatized, amino acid stem names are used as a combining term rather than chemical names, e.g., Glutamyl Hydroxyphenylhydrazide, Prolyl Histamine HCl, Palmitoyl Lysyl Aminovaleroyl Lysine.
58. The prefix “dimer” precedes the term “dilinoleic” to designate materials that are C36 di-acids; it has historical usage in INCI nomenclature, e.g., Dicitaryl Dimer Dilinoleate.
59. The prefix “nor” is used to designate “de-methyl” which means one methyl group removed relative to the parent compound for the purposes of nomenclature, e.g., Norvaline.

### **Synthetic Peptides**

60. a. Synthetic Peptides consisting of two to ten amino acid residues are named using the appropriate prefix, di-, tri-, tetra-, etc., followed by the term peptide and an arbitrary number, e.g., Dipeptide-2, Decapeptide-4, Acetyl Pentapeptide-3. The constituent amino acids are identified in the monograph definition. There are a few peptides that are historically named by their amino acids, e.g., Glycyl Glycine, and these names have been grandfathered. Additionally, Glutathione is a grandfathered name for the peptide, glutamyl cysteinyl glycine; whereas Tripeptide-35 is composed of the same amino acids but of possible differing sequence.
- b. Synthetic peptides consisting of 11 to 100 amino acids are designated by the term oligopeptide, followed by an arbitrary number, and the constituent amino acids are

- identified in the monograph definition; e.g., Oligopeptide-13.
- c. Synthetic peptides consisting of more than 100 amino acids are designated by the term polypeptide, followed by an arbitrary number, and the constituent amino acids are identified in the monograph definition; e.g., Polypeptide-5.
  - d. The amino acid residues composing the peptide are listed alphabetically in the monograph definition. The amino acid residues may include the following: Alanine, Arginine, Asparagine, Aspartic Acid, Cysteine, Glutamic Acid, Glutamine, Glycine, Histidine, Isoleucine, Leucine, Lysine, Methionine, Phenylalanine, Proline, Serine, Threonine, Trptophan, Tyrosine, Valine.
  - e. When the peptide contains an amino acid that is not one of the natural amino acids identified above, (e.g., D-isomers or gamma amino acids) it is identified in the peptide name, e.g., Tripeptide-9 Citrulline, Palmitoyl Dipeptide-28 D-Serine Dipeptide-7 Palmitamide.
  - f. Peptide derivatives are named utilizing the parent peptide name, and the name of the modifying group as follows:
    - i. When the N-terminus is modified, the name of the modifying group precedes the peptide name, e.g., Myristoyl Hexapeptide-5.
    - ii. When the C-terminus is modified, the name of the modifying group is identified after the peptide name according to its composition, e.g., Tripeptide-9 Citrulline, Caffeoyle Tetrapeptide-19 Caffeamide, Tetrapeptide-29 Argininamide, Acetyl Octapeptide-17 Amide.
    - iii. When any hydroxyl group or amine group along the peptide chain is modified, it is named according to the composition of the reacting species,
  - g. Ingredients originating from human tissue, including materials starting with human cells in tissue culture, will contain "human" as part of the INCI name. This does not include ingredients made by recombinant technology.
  - h. Ingredients that are derived from recombinant technologies will be identified by the term "r" as a prefix to the INCI name. For example, the term "rh" is utilized to identify "recombinant human" peptides. This includes materials that are synthesized from human gene origin. Ingredients derived by recombinant technologies that utilize other organisms are identified by "r-" followed by the name of the organism, e.g. r-Mussel Polypeptide-1, r-Saccharomyces Polypeptide-1, r-Clostridium Histolyticum Collagenase.
  - i. Ingredients which are synthesized to be identical to human proteins or portions, e.g., small peptides, will be designated by the term "sh" for synthetic human, e.g., sh-Oligopeptide-X. This term will be identified in the definition as synthetic human.
  - j. Transgenic organisms, a subset of genetically modified organisms (GMOs), are viable higher organisms which contain inserted DNA that originated in a different species. Proteins that are derived from a transgenic viable higher organism are identified by the term "transgenic" followed by the name of the host organism and appropriate peptide name, e.g., Transgenic Barley sh-Oligopeptide-1; Transgenic Tobacco r-Jellyfish Polypeptide-1; Transgenic Rice rh-Polypeptide-45. Common names are typically used to identify the host organism. However, if the species name is uncommon or not previously related to a genus associated with a common name, the host name is described by its genus/species, e.g., Transgenic Nicotiana Benthamiana sh-Polypeptide-

7.

- k. Proteins or peptides that are derived from two or more different proteins are considered fusion proteins. They are named by combining the INCI names of each appropriate individual peptide name, e.g., r-Clostridium Histolyticum Collagenase sh-Oligopeptide-60; r-Mussel Polypeptide-1 r-Mussel Oligopeptide-1 sh-Polypeptide-1.

### **Transesters**

61. Transesters are materials derived by the process of the transesterification of triglycerides (fats and oils) and alcohols, and are identified by the term “esters”, e.g., Apricot Kernel PEG-8 Esters, Hydrogenated Castor Oil PEG-8 Esters, Triolein PEG-6 Esters. Transesters can also be obtained by the transesterification of the natural oil with a hydrogenated oil, e.g., Moringa Oil/Hydrogenated Moringa Oil Esters, Macadamia Seed Oil/Hydrogenated Macadamia Seed Oil Esters.

## **MISCELLANEOUS CONVENTIONS**

62. Amidino is the root used to designate the structure  $R-C(NH_2)=NH$ , e.g. Amidinoproline.
63. “Esylate” is the term used to designate ethanesulfonate, e.g., Sodium Esylate. “Tosylate” is the term used to designate toluenesulfonate, e.g., Cetrimonium Tosylate.
64. Estolides are esters formed by the polymerization of 2 or more hydroxyl fatty acids (e.g., 12-hydroxystearic acid), or by the acid-catalyzed condensation of 2 or more unsaturated fatty acids (e.g., oleic acid) to form oligomeric esters. The product is named “estolide” preceded by the name of the fatty acid which makes up the oligomer backbone.
65. The compound known as conjugated CLA is named as Isomerized Linoleic Acid.
66. Encapsulated materials are named as mixtures with the components identified in order of predominance.
67. Solutions that are characterized as the dispersion of very small particles in a continuous phase that remain suspended are named colloids, e.g., Colloidal Silver, Colloidal Platinum.
68. Zwitterions are internal salts and are identified as “betaines” and “sultaines”, e.g., Cocamidopropyl Betaine, Cocamidohydroxypropyl Sultaine.
69. Hydrocarbons derived by the complete hydrogenation of an unfractionated fatty acid are named according to the source of the fatty acids, e.g., Coconut Alkanes. See also Conventions 20 and 21.
70. “Lactylate” is the combining term used to describe the ester formed between two moles of lactic acid, e.g., Sodium Stearoyl Lactylate, Sodium Cocoyl Lactylate.
71. “Ascorbate” is used in INCI names for ingredients produced by the reaction of an alcohol with ascorbic acid, e.g., Glyceryl Ascorbate, or when a salt of ascorbic acid is formed, e.g., Calcium Ascorbate. “Ascorbyl” is used for esters between ascorbic acid and a fatty acid or phosphoric acid. “Ascorbic” is used when an ether is formed with ascorbic acid, e.g., 2-O-Ethyl Ascorbic Acid.

72. Process terms are not usually utilized in INCI nomenclature, e.g., "heat-induced". Exceptions include terms such as acetylated, epoxidized, extract, ferment, hydrolyzed, hydrogenated, lysate, ozonized.
73. For products marketed in the EU which contain ingredients that meet the definition for a nanomaterial as identified by the EC Regulation No. 1223/2009, the INCI name (Nano) may be applied as a suffix to the corresponding INCI name. For example, usage of titanium dioxide that meets the EC definition for nano would be declared on the finished product label as Titanium Dioxide (Nano).