INCI - Nomenclature Conventions

The conventions used for establishing INCI names are as follows:

1. In order to facilitate use and clarity, INCI names have been designed to require a minimum of punctuation and capitalisation.
2. Wherever new nomenclature has been adopted, every effort has been made to use the shortest name consistent with these rules.
3. Simple chemical names are used wherever possible.
4. Recognised chemical abbreviations are used where applicable. A list of the abbreviations used in the Inventory may be found under the section “Abbreviations”.
5. Traditional stems are retained as combining forms when consistent with other systems (see rule 17).
6. Abbreviations are utilised for simplifying the nomenclature of families of complex ingredients when applicable (see abbreviation list under the section “Abbreviations”).
7. Compounds that are related or are similar to materials described in recognised sources are named, whenever possible, by analogy to the listed names.
8. Singly substituted derivatives do not usually 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.
9. The term ‘Glyceride’ has been utilized to describe a monoglyceride. Mixtures of mono-, di- and triglycerides are referred to as ‘Glycerides’. Triglycerides are assigned specific nomenclature, e.g. Tristearin.
10. Multiple substitution is routinely described with the appropriate prefix such as ‘di-‘, ‘tri-‘ or ‘tetra-‘, e.g. Glyceryl distearate.
11. Names of ingredients, other than colours, that contain terminal numbers are generally hyphenated. Derivatives of hyphenated materials retain the original hyphen, e.g. Laureth-3, Laureth-3 phosphate.
12. Hydration states are not usually expressed.
13. Straight-chain alkyl groups are described by their common stem names (see rule 17).
14. Materials containing mixtures of even-carbon chain length fractions are named by the appropriate commonly used fatty stem term, e.g. Cetearyl alcohol (C16 and C18). Materials containing mixtures of even- and odd-carbon chain length fractions are designated by alternative nomenclature, e.g. C12-15 alcohols (C12, C13, C14 and C15).
15. Branched-chain alkyl groups are usually described by the prefix ‘iso’ followed by the common stem name for the comparable straight-chain group (e.g. Isostearyl alcohol, Isocetyl alcohol) – see also rule 17. The major exception to this rule is the nomenclature for the 2-alkyl of Guerbet alcohols. These are named by standard chemical rules (e.g. Ethylhexanol, Octydodecanol, Decyltetradecanol). Derivatives are named accordingly (e.g. Ethylhexyl myristate, Cetyl ethylhexanoate, Diethylhexylamine, Triethylhexanoin, Butyloctanoic acid).

16. The following table has been included to clarify the nomenclature for derivatives of caproic, caprylic and capric acids.

Chain length	*Stem name*	*Acid*	*Ester*
C6	Capro	Caproic	Caproate
C8	Capryl	Caprylic	Caprylate
C10	Capr	Capric	Caprate

Chain length	*Acyl*	*Alkyl*	*Ampho*
C6	Caprooyl	Caproyl	Caproo
C8	Capryloyl	Caprylyl	Caprylo
C10	Caproyl	Capryl	Capro

17. The following table describes the nomenclature applied to straight-chain acids and alcohols. Branched-chain acids and alcohols utilize the names listed in this table preceded by the term ‘iso’ (e.g. Isostearic acid). Guerbet alcohols, however, are designated by specific names (e.g. Octyldodecanol). (See also rule 15).

	Acid	*Alcohol*
Saturated:		
C6	Caproic	Hexyl
C7	Heptanoic	Heptyl
C8	Caprylic	Caprylyl
C9	Pelargonic	Nonyl
C10	Capric	Decyl
C11	Undecanoic	Undecyl
C12	Lauric	Lauryl
C13	Tridecanoic	Tridecyl
C14	Myristic	Myristil
C15	Pentadecanoic	Pentadecyl
C16	Palmitic	Cetyl
C17	Margaric	Heptadecyl
C18	Stearic	Stearyl
C20	Arachidic	Arachidyl
C22	Behenic	Behenyl
Unsaturated:		
C11	Undecylenic	Undecylenyl
C16	Palmitoleic	Palmitoeyl
C18	Oleic	Oleyl

C18	Linoleic	Linoleyl
C18	Linolenic	Linolenyl
C20	Arachidonic	Arachidonyl
C22	Cetoleic	Cetoleyl
C22	Erucic	Erucyl

18. The nomenclature for ingredients consisting of mixtures of similar materials (e.g. fatty acids, fatty alcohols) is determined on the basis of the chemical identity of the raw material as purchased. Mixtures that reflect the original distribution of components due to their natural source (e.g. coconut) are named utilizing the source stem (e.g. coconut alcohol). If the original natural distribution has been significantly cut or enriched, the mixture is named on the basis of the predominant component.

19. Names of lanolin derivatives usually contain the stem ‘lan’, e.g. Laneth-60.

20. Because of the existing widespread use of these denominations, alkanolamides are named from the parent alkyl amide and the appropriate abbreviation for the amine used, e.g. Cocamide MEA.

21. 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).

22. 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-subsituted quaternary nitrogen; ‘trimonium’ describes a trimethyl-substituted quaternary nitrogen.

23. The terms quaternium/polyquaternium are used to describe complex quaternary ammonium salts that do not have a common name or that cannot be named by analogy to established names (e.g. Quaternium-82, Polyquaternium-20).

24. The term ‘ampho’ has been used as a combining term in the nomenclature for amphoteric surfactants derived from imidazoline intermediates. In naming these compounds, this stem is combined with the appropriate stem names for the subsituent groupings (e.g. Sodium Cocoamphoacetate).

25. 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.

26. Biological materials are named by specific terms (e.g. Hyaluronic Acid, Hydrogenated Menhaden Oil) when the material has been isolated, purified and chemically characterized. Alternative nomenclature for biologicals is utilized to name materials in accordance with the extent of their processing. They may have INCI names based on: (a) the Latin name of the genus, or (b) primarily on designations from Pharmacopoeias, followed by the part used if pertinent, and the type of preparation if pertinent (e.g. extract, oil, powder, etc.). For mammalian derived ingredients, usually (c) the INCI names are based on the English name of the part used, if pertinent (e.g. connective tissue, spleen, stomach, etc.) and the type of preparation, if pertinent (e.g. extract, oil).

    Examples of INCI names for biologicals are (a) Brevoortia Oil; (b) Faex

Extract; (c) Connective Tissue Extract.

27. Cosmetic colorants have INCI names according to the nomenclature used in Annex IV to Directive 76/768/EEC.

28. Hair dye ingredients are named according to chemical structure. In the event that chemical names are very complex, a colour/number combination is used prefixed by the letters 'HC'.

29. Denatured alcohols are designated by the INCI name 'Alcohol denat.'. Alcohol denat. is ethyl alcohol that is denatured with one or more denaturing agents in accordance with the national legislation of each Community Member State.

30. Materials derived from plants are known as botanicals. In general, these ingredients have not undergone chemical modifications and include plant derived ingredients such as extracts, juices, waters, distillates, powders, oils, unsaponifiables, etc. They have INCI names based on the international Linné designated nomenclature of the genus and the species, followed by the plant part, if pertinent or applicable (e.g. leaf, fruit, bark, etc.), and the type of preparation (e.g. extract, oil, powder, etc.). Chemical derivatives of botanicals follow the nomenclature rules for chemicals (e.g. Cocoglyderides, Hydrogenated Castor Oil, Hydrogenated Palm Acid, Olive Acid, Palm Alcohol, Soyamide DEA, Sulfated Olive Oil, etc.).
The following references are used to establish the Linné-derived for botanicals: (a) The primary referece is Penso, G., *Index Plantarum Medicinalium Totius Mundi Eorumque Synonymorum*, O.E.M.F. Milano (1983 – ISBN N° 88-7076-027-8. (b) When the genus and species is not identified in the text cited in (a), a variety of secondary sources are utilised including the following, in order of priority: (1) Steinmetz, E.F., *Codex vegetabilis*, Amsterdam (1957); (2) Hoppe, H.A., *Drogenkunde*, 8th Edition, Walter de Gruyter, Berlin, Volume 1 (1957 – ISBN N° 3-11-00-8), Volume 2 (1977 – ISBN 3-11-006660-2); (3) Mabberley, D.J., *The Plant Book – A portable dictionary of higher plants*, Cambridge 1992 – ISBN N° 0-521-34060-8; (4) Hoppe H.A., Levring T., Tnaka Y., *Marine Algae in Pharmaceutical Science*, Walter de Gruyter, Berlin, New York, 1979.

31. 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. In all cases where arbitrary numbers are used, these numbers are preceded by names suggestive of the structure or the composition of the material. Each name/number combination represents a specific ingredient that is listed in the Inventory. The following name/number series of combinations have been used:

    (a) Benzophenone
        This term is used for all benzophenon derivatives (e.g. Benzophenone-2).

    (b) HC colour
        See rule 28.

    (c) Quaternium/Polyquaternium
        See rule 23.

    (d) Hydrofluorocarbon/Hydrochlorofluorocarbon
        These terms are used for hydrohalocarbon aerosol propellants (e.g.Hydrofluorocarbon 152a,
        Hydrochloroflurocarbon 142b).

    (e) Polysilicone
        common names or established conventions for silicone compounds

(e.g. Poylsilicone-1)

(f) Polyacrylate-
see rule 49.

(g) Polyester-
see rule 49.

(h) Polyether-
see rule 49.

(i) Polyurethane-
see rule 49.

32. Commercial raw materials are often deliberate mixtures of several components. The mixtures do not appear as such and must be identified by listing the individual components (e.g. Kathon CG: Aqua, Chloromethylisothiazolinone, Methylisothiazolinone, Magnesium chloride, Magnesium nitrate).

33. The INCI names for extracts represent the 'material extracted' and do not include reference to the extracting solvents and/or other diluents that may be present in these materials.

34. Solvents and/or diluents contained in commercially available raw materials such as surfactants, polymers and resins are not normally identified as part of the INCI name.

35. Polyethylene glycol (polyoxy-1, 2-ethanediyl) is abbreviated to the acronym "PEG". Polyethylene glycol homopolymers are named as PEG-X, where X is the average number of ethylene oxide monomer units, e.g. PEG-10.
Ethoxylated alcohols are named by combining the conventional alcoholic stem name with the suffix "eth" followed by the average number of ethylene oxide monomer units, e.g. Laureth-10.
Esters of polyethylene glycol homopolymers are named as PEG derivatives, e.g. PEG-10 stearate.
Other ethoxylated substances are named accordingly, e.g. PEG-6 cocamide.
Because names based on the approximate molecular weight of the ethylene oxide polymer are also in common use, the following table is provided to allow easy conversion between the two systems:

Approximate Molecular Weight	Average Number of Monomer Units
100	2
200	4
300	6
400	8
450	9
500	10
600	12
1000	20

1540	32
1800	36
2000	40
3000	60
4000	75
6000	150
8000	180

36. Polypropylene glycol (polyoxy-1, 2-propanediyl) is abbreviated to the acronym “PPG”. Polypropylene glycol homopolymers are named as PPG-X, where X is the average number of propylene oxide monomer units, e.g. PPG-10.
Esters and ethers of polypropylene glycol homopolymers are named as PPG derivatives, e.g. PPG-10 stearate, PPG-10 lauryl ether.
Other propoxylated substances are named accordingly.

37. PEG and PPG polymers or their derivatives in which one of the terminal primary alcohol groups (-CH2OH) has been oxidised to a carboxylic acid (-COOH) are named by adding the term “carboxylic acid” or “carboxylate” to the parent name of the original polymer, e.g. PEG-10 carboxylic acid, Coceth-7 carboxylic acid, Ammonium laureth-8 carboxylate.

38. The term ‘Pareth’ applies to ethoxylated parffinic alcohols containing both even- and odd-carbon chain length fractions.

39. The term ‘Acrylates’ is used to describe linear, non-cross linked copolymers that contain combinations of acrylic acid, methacrylic acid and their methyl, ethyl, propyl or butyl esters. Similarly, the term ‘Crotonate(s)’ is used to describe the copolymers that contain combinations of crotonic acid and its methyl, ethyl, propyl or butyl esters.

40. The name ‘Carbomer’ is used to describe high molecular weight cross-linked homopolymers of acrylic acid. The cross-linking agent(s) is (are) identified in the ingredient entry definition. (See also rule 41)

41. The term ‘cross-polymer’ is used to describe polymers other than Carbomer that are cross-linked. (See also rule 40)

42. The term ‘Poloxamer’ denotes a symmetrical block copolymer formed by ethoxylation of polypropylene glycol. Substances with differing degrees of polymerisation are further identified by a code number derived from the molecular weight of the polymer.

43. The term ‘Meroxapol’ denotes a symmetrical clock copolymer formed by the propoxylation of polyethlene glycol. Substances with differing degrees of polymerisation are further identified by a code number derived from the molecular weight of the polymer.

44. The term ‘Poloxamine’ denotes a symmetrical block copolymer formed by successively propoxylating then ethoxylating ethylene diamine. Substances with differing degrees of polymerisation are further identified by a code number derived from the molecular weight of the polymer.

45. Copolymers of ethylene glycol and propylene glycol which do not form symmetrical block copolymers are named as PEG/PPG-X/Y derivatives where X and Y are the

average number of ethylene oxide and propylene oxide monomer units respectively.

46. The term ‘Alkoxyno-n’ means an ethoxylated alkyl phenol where n indicates the average number of ethylene oxide units.

When the name is:	the alkyl is:
octoxynol	tetramethylbutyl
nonoxynol	nonyl
dodoxynol	dodecyl
pentadoxynol	pentadecyl

47. Biotechnological materials are substances derived by the action of micro-organisms, such as bacteria or yeasts, on a substrate to produce materials by fermentation, metabolism, hydrolysis, lysis or other processes. The process may involve the use of nutrients or other materials such as enzymes. The resulting product is referred to as a ‘culture’ or ‘ferment’. The ferment can be further processed by extraction, filtration, and/or other procedures 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 or Xanthan Gum.
    (b) When the end product does not have a common or usual name, the product will be named using the genus of the micro-organism, followed by a slash and the name of the substrate (if applicable), followed by the work ‘ferment’. Substrates will be identified by their common, usual, or other technical name, e.g. Lactococcus/Carrot Ferment. On a case-by-case basis, the genus and species name of the micro-organism may be used when the used of the genus only may be misleading and the identification of the species is needed for clarity, e.g. Candida bombicola 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 or Dextran.

48. The term ‘Ceramide’ as part of an INCI name will be assigned to those classes and structures of natural lipids derived from skin as reported by Wertz P.W., Miethke M.C., Long S.A., Strauss J.M. and Downing D.T. in ‘*The composition of ceramides from human stratum corneum and from comedones’*, The Journal of Investigative Dermatology, 84, 410-412 (1985).
A synthetic N-acylated sphingoid base that is identical to any one of the many constituents of the natural ceramides, as reported by Wertz, will be assigned an INCI labelling name using the term ceramide followed by a number (e.g. Ceramide 3) or a number and Roman numeral (e.g. Ceramide 6II). The term ceramide as part of the INCI name will only be assigned to a synthetic N-acylated sphingoid base that contains, as the predominant component, the 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 composition present in a mixture.
Synthetic N-acylated sphingoid bases that do not have the erythro configuration, or otherwise are not constituents of natural ceramides as described by Wertz, 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 labelling 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 erythro isomer and otherwise conforms in composition to the above criteria.

49. 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 in rule 33.

50. Synthetic peptides consisting of 2 to 10 amino acid residues are named using the appropriate prefix, di-, tri-, tatra-, etc., followed by the term peptide and an arbitrary number, e.g. Dipeptide-2.
Synthetic peptides consisting of 11 to 100 amino acids are designated by the term oligopeptide, followed by an arbitrary number.
Synthetic peptides consisting of more than 100 amino acids are designated by the term polypeptide, followed by an arbitrary number.
The amino acid residues composing the peptide are listed alphabetically in the entry definition in Section 1.
The amino acid residues may include the following:

Alanine	Glutamine	Phenylalanine
Arginine	Glycine	Proline
Asparagine	Histidine	Serine
Aspartic Acid	Isoleucine	Threonine
Cysteine	Leucine	Tryptophan
Cystine	Lysine	Tyrosine
Glutamic Acid	Methionine	Valine

51. Polymer nomenclature – Polymeric materials are named according to the name in common usage if it is well known, or by the structure if well defined. If no common name exists, and the structure is not well defined, the polymers are named according to their source, as described below.
Homopolymers (consisting of one constituent monomer) are named by placing the term ‘poly’ before the constituent monomer, e.g. Polyisobutene.
Copolymers and Crosspolymers (consisting of two or more constituent monomers) are named by listing the monomers separated by a slash (/) followed by the work ‘Copolymer’ or ‘Crosspolymer’, respectively, e.g. Acrylates/Acrylamide Copolymer, Acrylates/VA Crosspolymer.
Copolymers consisting of four or more monomers may be given an INCI name according to their class followed by an arbitrary number, e.g. Polyester-1, with the monomers listed in the entry definition of the material. Such nomenclature is granted at the discretion of the INC, with a purpose of shortening lengthy INCI names.
Thus far, the only classes of polymers to be created for this type of nomenclature are Polyesters, Polyacrylates and Polyurethanes. More classes may be added in the future, if the need arises.