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# *Green Cosmetics*

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# *Characteristics*



## *Green Products*

- + reducing the use of raw material and packaging;
- + developing multiple utility products,
- + using recycled materials,
- + reducing the use of natural resources,
- + making products safer for health and less toxic for the environment,
- + increasing the lifetime of the products,
- + developing reusable products or packaging,
- + obtaining products for remanufacture and recycling,
- + recovering products for recycling,
- + designing products that can be buried or incinerated



## *Green Cosmetic Ingredients*

- + “Green Cosmetic Ingredients,” deals with all aspects of “greenness” in cosmetics, from natural sources to ecofriendly chemical processes. This broad range of topics recognizes that green does not necessarily mean natural.
- + Ingredients are “green” when all details of sourcing, manufacturing, disposal (including information concerning energy and water use, as well as eco- and human toxicity) are taken into account. This is true even if “chemical steps” are involved. Synthetics can be green as long as they have been produced following Green Chemistry principles.

### Green Chemistry Pocket Guide

#### The 12 Principles of Green Chemistry

Provides a framework for learning about green chemistry and designing or improving materials, products, processes and systems.

1. Prevent waste
2. Atom Economy
3. Less Hazardous Synthesis
4. Design Benign Chemicals
5. Benign Solvents & Auxiliaries
6. Design for Energy Efficiency
7. Use of Renewable Feedstocks
8. Reduce Derivatives
9. Catalysis (vs. Stoichiometric)
10. Design for Degradation
11. Real-Time Analysis for Pollution Prevention
12. Inherently Benign Chemistry for Accident Prevention

[www.acs.org/greenchemistry](http://www.acs.org/greenchemistry)






- Ethical sourcing of ingredients
- Organic and sustainable production methods
- Green chemistry / formulations
- Sustainable packaging
- Energy sources & use
- Carbon & water management
- Operational efficiency
- Waste management







In Brazil, the certification agency to these products "Instituto Biodinâmico de Certificações", classified them as:

+ **Organics:** when **at least 95%** of the formulation components, less water, are organic raw material with extraction certificate or raw materials that follow strict standards of production, extraction, purification and processing. These raw materials can be obtained through certificated crops and extraction, it's fundamental that they are biodegradable and that they preserve the most natural chemical characteristics. An organic raw material is always natural. The last remaining 5% of the formulation may be composed of water, natural raw materials, coming from agriculture or non-certified allowed extractive for organic formulations.





+ **Natural:** a cosmetic can be classified as natural and be certified if the formulation is composed of **natural raw materials** certified or not. Natural raw materials are **vegetable or mineral products**, most often produced in a conventional condition and not always adhering to the criteria established for organic production. A natural raw material is not necessarily organic.

+ **With raw organic or organic ingredients**, prepared or made with organic raw materials is **at least 70% and at most 95%** of the formulation components, discounting water, are certified organic. The remainder of the formulation may consist of water, natural raw materials coming from agriculture, extraction or non-certified allowed for organic formulations.



	Organic	Natural
<b>fraction of plant ingredients</b> from organic agriculture on the total plant ingredients	95%	50%
<b>minimum</b> proportion of these ingredients in the final product	20-10%	5%
Source: French certification agency, <b>Cosmetics Organic Standard – Cosmo</b> (subsidiaries in Brazil, India, Canada, Ecuador, Colombia, Portugal, Japan and South Africa)		



In the US, four main labeling categories are permitted based on the percentage of organic ingredients in the product:

+ **"100% Organic" or "Organic"**: U.S. Department of Agriculture (USDA) products and cosmetics seeking USDA certification, labeled as "100% organic," must contain (excluding water and salt) **only organically produced ingredients** and be processed using only organically produced processing aids. Products labeled as "organic" must consist of at least **95% organically produced ingredients (excluding water and salt)**. Each organically produced ingredient must be identified as "organic" in the ingredient statement on the information panel, as part of the name of the ingredient, that is, "organic chamomile" or "chamomile (organic)," or through an asterisk or other reference mark linking to a footnote identifying the ingredient as "organic." Agricultural products labeled "100% organic" and "organic" cannot be produced or composed of components using excluded methods, sewage sludge, or ionizing radiation.





+ **"Made with Organic"**: Processed products that contain **at least 70%** organic ingredients can use the phrase "made with organic..." and then list up to three of the organic ingredients or ingredient categories on the principal display panel. Processed products labeled "made with organic..." cannot be produced using excluded methods, sewage sludge, or ionizing radiation.

+ **Less than 70% Organic**: Under the NOP regulations, processed products containing less than 70% USDA organic ingredients cannot use the term "organic" anywhere on the principal display panel. They may, however, identify the specific ingredients that are USDA certified as being organically produced in the ingredient statement on the information panel. The products in this category may include claims that specific ingredients are certified by USDA, but may not display the USDA Organic seal or include the name, address, or seal of a certifying agent.



## + PRODUCT CERTIFICATION

The certification aims to check **the ingredients, processes, production, storage of raw materials, packaging, labeling, use of energy resources and waste management and the certification of producers** to ensure the quality of the final product. Which means, the certification agencies **impose standards** that should be fulfilled by the production industry to be able to ensure the final product quality.

The certified products come from these advantages:

- + Control and tracking of the supply chain of raw materials;
- + Facilitates the recognition of certified products by the consumer;
- + Increased reliability of the brand;
- + Understanding of the consumer with prices between a certified product or not;
- + Recognition and differentiation of products on the market.





The major certification agencies for natural and organic products are:

- + Bundesverband Deutscher Industrie und Handelsunternehmen (BDIH) in Germany;
- + National Association for Sustainable Agriculture, Australia (NASAA) in Australia;
- + Soil Association Organic Standard in United Kingdom;
- + Instituto Biodinâmico de Certificações (IBD) in Brazil;
- + ECOCERT in France;
- + Istituto per la Certificazione Etica e Ambientale (ICEA) in Italy;
- + Quality Assurance International (QAI) in United States of America;
- + Oregon Tilth in United States of America;
- + Cosmetics Organic Standard (Cosmos) in European Union (EU);



# *Advantages and Disadvantages*





## *Advantages*

- + More environment-friendly (can also be a disadvantage)
- + Fewer side effects (long-term side effects)
- + Less likely to cause breakouts
- + No chemicals which may be carcinogenic / no harsh chemicals (e.g. parabens and phthalates)
- + Nutrient-rich products (e.g. cocoa butter)



## *Disadvantages*

- + More expensive
- + Shorter shelf-life
- + May cause allergic reaction
- + Not as effective as synthetic counterparts
- + For organic makeup: not water-proof or water resistant



# *Formulation*



## *Extraction*

- + Cold, pressure, water or steam distillation, percolation
- + Alcohol and glycerin (obtained in organic form)  
Water, CO<sub>2</sub>
- + Examples: vegetable oils, lanolin, natural dyes, minerals, natural polymers (xanthan gum, alginates)
- + Fermentation  
Aerobic or anaerobic



## *Extraction*

- + use natural materials with any forms of water or with a third solvent of vegetable origin (ex.: ethyl alcohol, glycerin, vegetable oils, honey and CO<sub>2</sub> supercritical)
- + If the use of other solvents is needed, the solvents have to be **recycled and completely removed** in the finished product.



# PROCESSES

## Allowed

- + Hydrolysis
- + Hydrogenation
- + Esterification
- + Saponification
- + Transesterification
- + Alkylation

## NOT Allowed

- + Ethoxylation
- + Sulfonation
- + Phosphorylation
- + Propoxylation
- + Polymerization



## *BANNED Raw Materials*

- + Synthetic dyes
- + Synthetic fragrances
- + PEGs
- + Quaternary ammonium
- + Silicones
- + Synthetic preservatives
- + Diethanolamides
- + Petroleum derivatives



## *Botanicals and Natural Products*

### + Spent coffee grounds

- Supercritical fluid extraction
- Yellow viscous oil extract
- Incorporated into non-ionic O/W creams
- Significant results: epidermal capacitance, transepidermal water loss (TEWL) and skin surface lipids of the stratum corneum

### + Ginkgo biloba and green tea extracts

- Photoprotective benefits

### + Aloe vera

- moisturizing agent





# *Botanicals and Natural Products*

- + choice of plant extracts or compounds
  - biological activity
  - toxicological assessment
  - stability
  - synergistic effects



# *O'right Green Headquarters*

- + Asia's first green cosmetics plant
- + Manufactures hair product



# *O'right Green Headquarters*

- + Taiwan EEWH Green Building Gold Certificate
- + achieves 7 out of 9 major green building indicators



# *Taiwan EEWI Green Building Index*

1. Biodiversity
2. Greenery
3. On-site Water Retention
4. Daily Energy Saving (Envelope, AC, Lighting)
5. CO2 Reduction
6. Construction Waste Reduction
7. Indoor Environment
8. Water Resource
9. Sewage & Garbage Improvement



*Issues and  
Controversies*



## *Issues and Controversies*

- + Undefined nature of the subject
  - Definition of “natural” and “organic”
- + Lack of solid case studies or proven performance statistics regarding natural or organic ingredients
  - “Safe choice” advertising



## *Issues and Controversies*

- + Green beauty care products are notoriously under-regulated
- + Consumers pay prices for “organic” products under the misconception that they are materially different than the non-organic products on the shelf
- + Body care manufacturers have set out to develop their own standards for organic processing
- + “Greenwashing”



# References

- + <http://www.businessinsider.com/cosmetic-industry-is-shockingly-unregulated-2015-10>
- + [https://www.organicconsumers.org/old\\_articles/bodycare/051203\\_natural\\_cosmetics.php](https://www.organicconsumers.org/old_articles/bodycare/051203_natural_cosmetics.php)
- + <https://www.cosmetic.org.tw/GMP/en/introduce/Oright.html>
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- + <http://www.globalhealingcenter.com/natural-health/6-reasons-to-use-organic-makeup/>

