GREENNOVATION:

UPCYCLING IN COSMETIC INGREDIENTS

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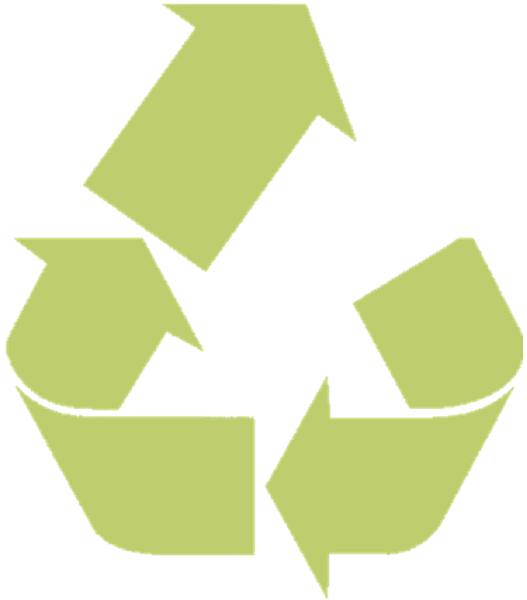
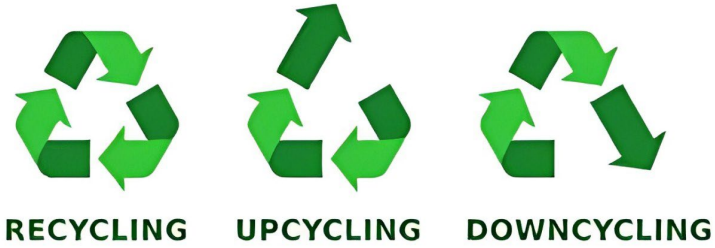
manufactured by SOCRI

The upcycling trend



Upcycling is reusing an item that will result in something of greater value than the original.



This trend involves transforming discarded materials or by-products into valuable ingredients for beauty products.

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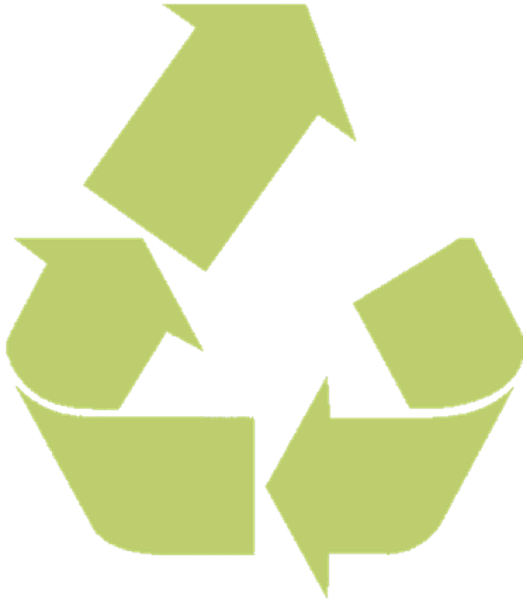
Upcycled beauty solutions



By repurposing waste, the industry reduces its environmental footprint and discovers novel, effective ingredients.

This rising approach is a creative solution that aligns ecological responsibility with consumer needs.

+5.4%

expected annual growth rate for upcycled cosmetic ingredients global market (2021-2031)

Source: Future Market Insights

Committed to sustainability

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Greengredients® specializes in crafting eco-conscious and upcycled cosmetic ingredients.

Our commitment to sustainability is matched by our dedication to research, leading to the creation of superior plant-based actives and functional ingredients.

In the upcoming slides, we will outline the upcycled raw materials used in our ingredients and detail the production processes of these upcycled materials, from waste to finished product.

Oleic Acid

obtained from non edible residues from olive oil production

SILGREEN C

C13-15 ALKANES, POLYGLYCERYL-6 OLEATE

SILGREEN G

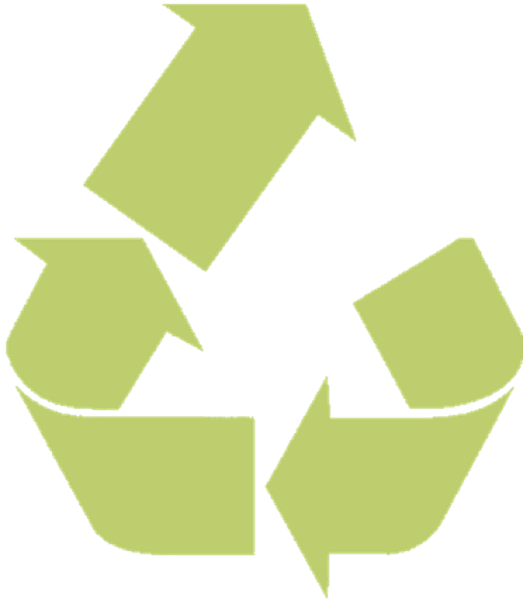
POLYGLYCERYL-4 OLEATE, GLYCERYL OLEATE, HYDROGENATED RAPESEED ALCOHOL

OLEAMULS WS

POLYGLYCERYL-6 OLEATE

SILICON REPLACEMENTS & CO-EMULSIFIERS

OLEIC ACID



The upcycling process

1

WASTE COLLECTION

The **initial phase** involves collecting **olive oil production waste**, including crushes olives and vegetation water.

2

EXTRACTION

The collected waste undergoes extraction to **separate oil containing oleic acid from water to solid residues**, employing mechanical methods like centrifugation or solvents.

3

CRUDE OIL PURIFICATION

The extracted oil still contains impurities and can undergo further **purification processes**, such as **filtration and decantation**, to remove solid particles and other undesirable substances.

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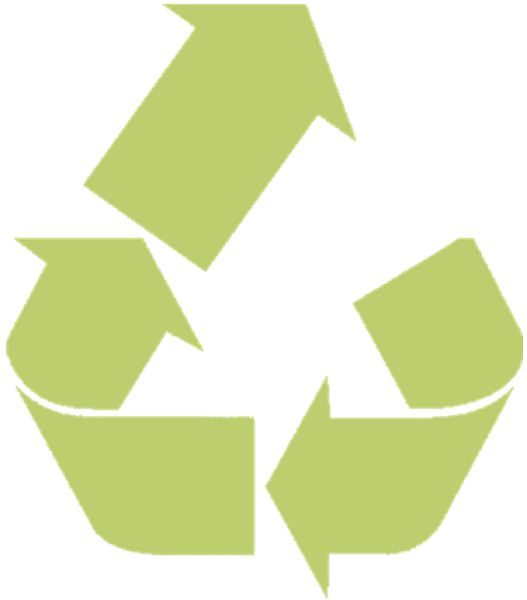
The upcycling process



4

HYDROLYSIS

The purified oil is subjected to **hydrolysis to break down the triglycerides into glycerol and free fatty acids**, including oleic acid.

5

SEPARATION AND PURIFICATION OF OLEIC ACID

The free fatty acids obtained can be separated through **fractional distillation** or other **separation techniques based on differences in volatility or solubility**. Oleic Acid is then isolated and purified.

6

FINISHING

The final product, pure oleic acid, can be **further treated** to remove any residual impurities and to ensure that it meets the quality standards required.

Betaine & Acetic Acid

obtained from molasses, a byproduct of sugar production

ACTIVES

GreenTAC

POLYGLYCERYL-4 DICOCOATE/BETAINATE LACTATE

LACTIQUAT

POLYGLYCERYL-3 BETAINATE LACTATE

PG6 ACTIVE HYDRA FACTOR

GLYCERIN, AQUA, PROPANEDIOL, POLYGLYCERIN-6, PCA, TREHALOSE, SORBITOL, BETAINE, SODIUM HYALURONATE

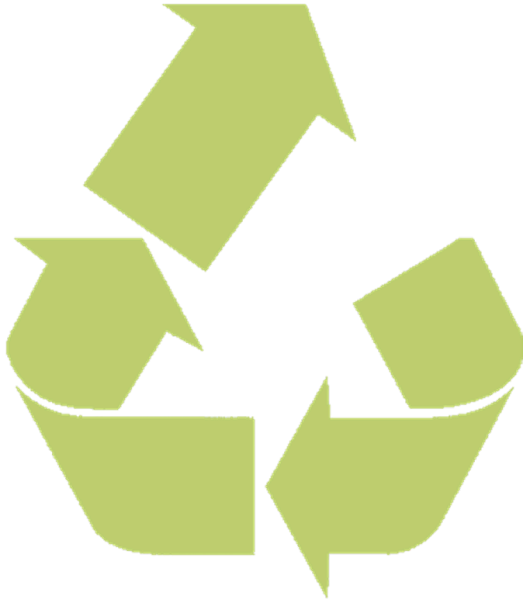
GREENPLEX

POLYGLYCERYL-3 BETAINATE MALATE, SULFATED CASTOR OIL, AQUA

GREENQUAT BT

POLYGLYCERYL-3 BETAINATE ACETATE

BETAINE &
ACETIC ACID



The upcycling process

1

MOLASSES COLLECTION

Molasses is a **dark, viscous liquid by-product of sugar refining**, rich organic compounds, including **betaine and acetic acid**.

2

DILUITION AND PREPARATION

Molasses is **diluted with water** to reduce viscosity and facilitate extraction processes, but also include **pH adjustment**.

3

EXTRACTION

Betaine solution is concentrated and crystallized. The extraction is performed through chromatography.
Acetic acid is obtained through molasses **fermentation**.

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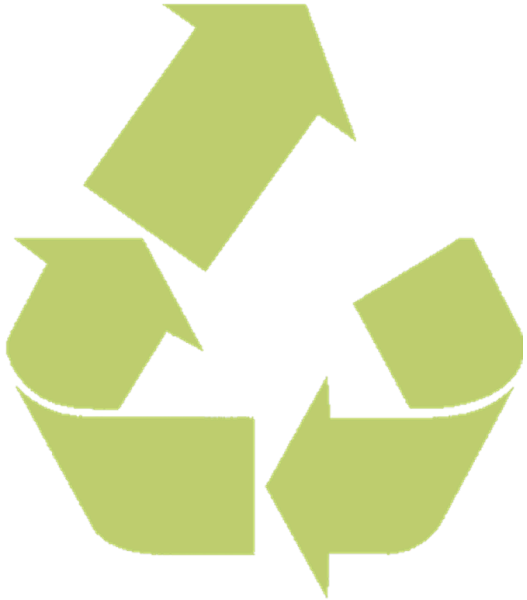
BETAINE



The upcycling process

1

CRYSTALLIZATION

The concentrated betaine solution is cooled to induce **betaine crystallization**.

2

SEPARATION AND WASHING OF CRYSTALS

Betaine crystals are **isolated by filtration or centrifugation**, then **washed** to remove surface impurities using water or suitable solutions.

3

DRYING

The washed betaine crystals are **dried** to remove residual moisture. Drying can be conducted in vacuum dryers, fluid bed dryers, or with other suitable methods.

4

FINAL PURIFICATION

For higher purity, betaine can undergo **recrystallization or activated carbon treatment**, ensuring it meets the required standards for final applications.

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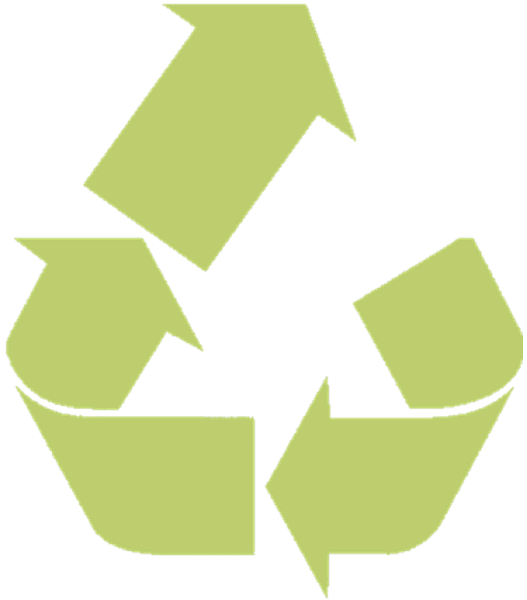
The upcycling process



1

ACETIC ACID COLLECTION

After fermentation, the liquid contains **acetic acid**, **sugar residues**, **alcohol**, and other by-products. This liquid is subjected to **distillation** or **extraction to separate the acetic acid** from the other components.

2

ACETIC ACID PURIFICATION

The collected acetic acid can be **further purified to remove impurities** and achieve the desired concentration and purity through fractional distillation.

Malic Acid

obtained from non-edible by-products of the apple processing cycle.

ACTIVES

GREENPLEX

POLYGLYCERYL-3 BETAINATE MALATE, SULFATED CASTOR OIL, AQUA

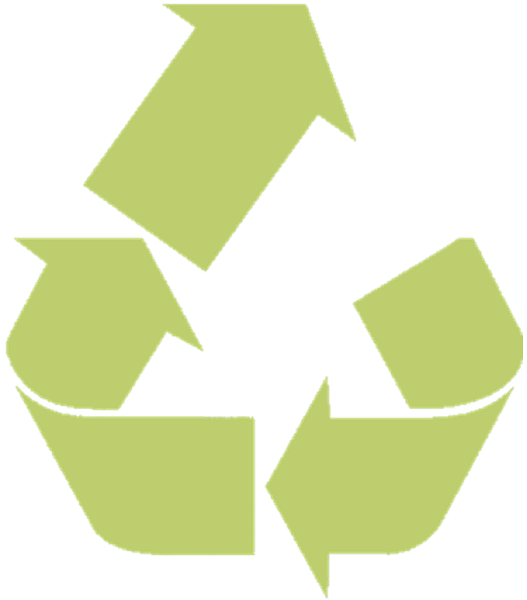
SESAMULS WO

POLYGLYCERYL-6 PENTAOLEATE, SESAMUM INDICUM SEED OIL, MALIC ACID

SESAMULS OW

POLYGLYCERYL-3 CETYL ETHER, SESAMUM INDICUM SEED OIL, MALIC ACID

The upcycling process



1

BY-PRODUCT COLLECTION

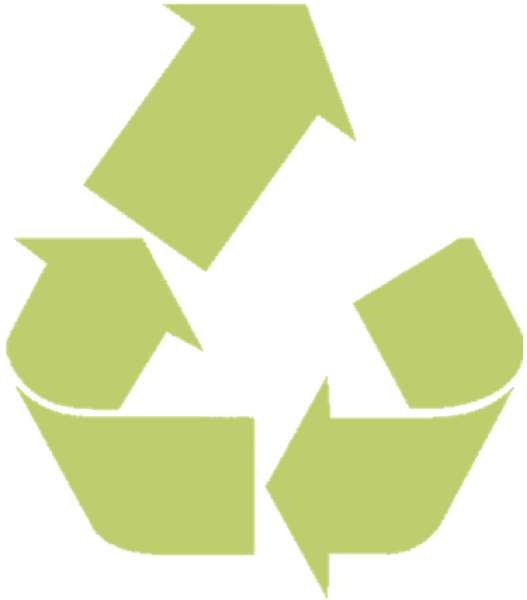
The collection of fruit by-products, such as **peels**, **seeds**, and **leftover pulp** after the production of fruit juices or other food processing activities.

2

BIOMASS PREPARATION

The prepared suspension is **inoculated with specific strains of microorganisms**. Fermentation requires controlled conditions of temperature, pH, and oxygenation to maximize malic acid production.

The upcycling process



3

FERMENTATION

The extracted oil still contains impurities and can undergo further **purification processes**, such as **filtration and decantation**, to remove solid particles and other undesirable substances.

4

EXTRACTION AND PURIFICATION

After fermentation, **malic acid is extracted from the fermentation medium**. This can be done through filtration, adsorption onto resins, or precipitation. The extracted malic acid is then **purified** using techniques like **crystallization** or **distillation** to remove impurities and obtain the final product in pure form.

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