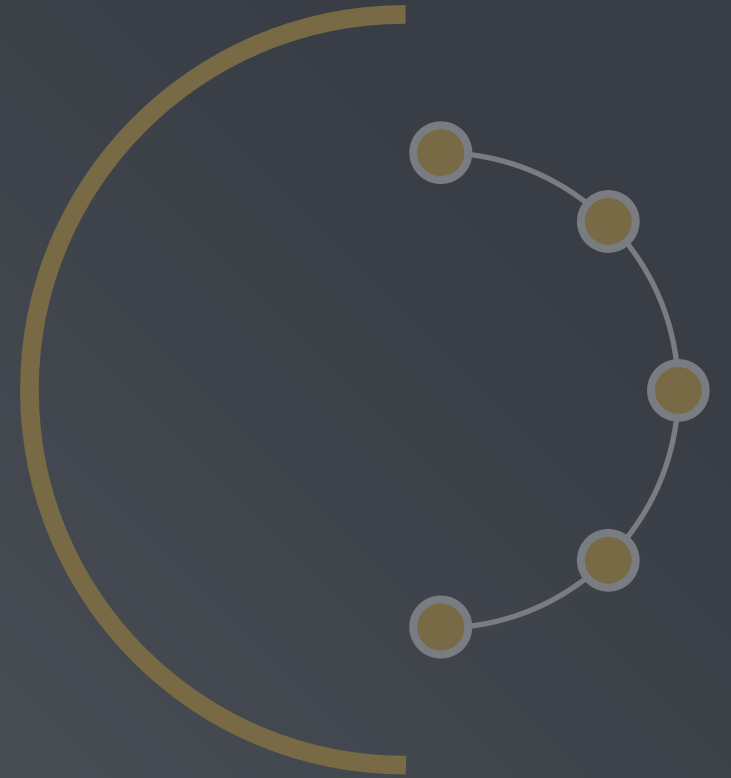


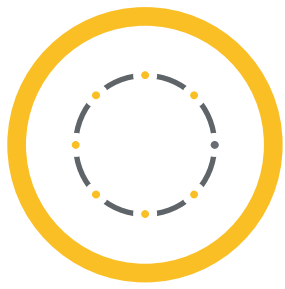


CARBOHYDE
SUGAR IS LIFE



Cyclodextrins

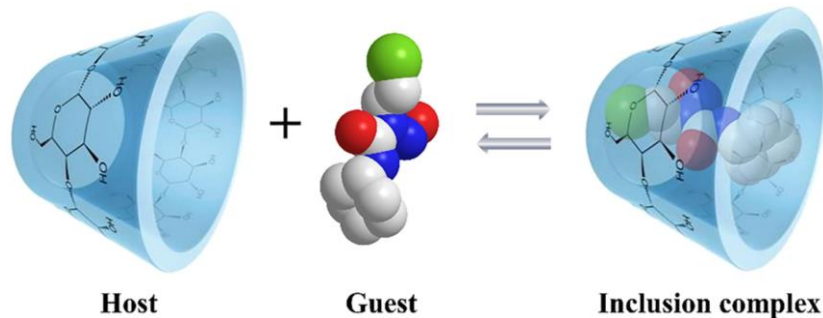
Application in Cosmetics



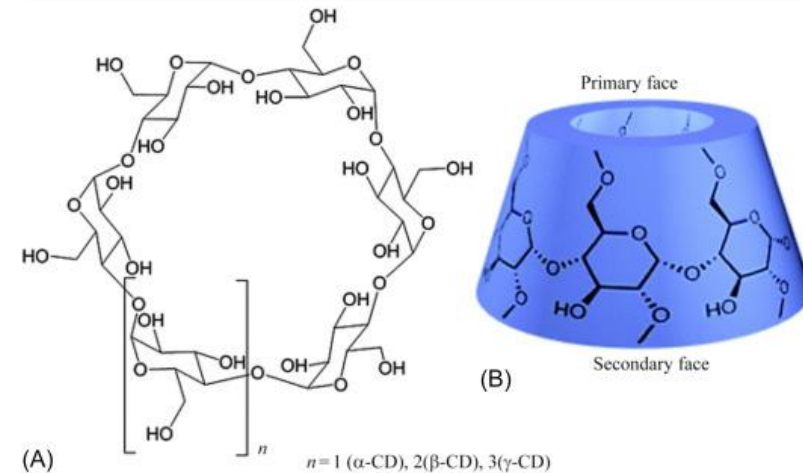
What are Cyclodextrins (CDs)?

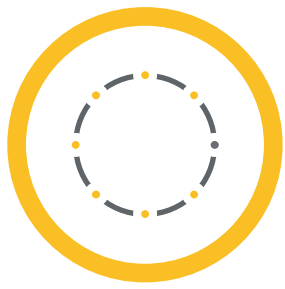
Properties

- Naturally occurring cyclic molecules composed of sugars
- Safe to use
- Used in food, cosmetics & hygiene, pharmaceuticals, agriculture, etc.
- Sub-nanometer sized molecular containers with hydrophilic outer phase and hydrophobic interior properties
- Reversible inclusion complex formation



Structure and application of CDs





Advantages of CDs in Cosmetics

Solubilizing

- insoluble compounds can be **dissolved** via CD complexation **without** the use of **organic co-solvents or surfactants**
- **easier to incorporate** into formulations
- **change of viscosity** of formulations is possible

Stabilizing

- **protection** of light- or oxygen-sensitive substances
- enhanced properties of molecule complexed by CDs
- longer expiry time



Process improvement

- Conversion of **liquids and oily materials** into powders results in easier handling
- increase the stability of **emulsions and suspensions**
- **incompatible compounds** can be mixed and used together in complexed form.



Advantages of CDs in Cosmetics

Controlled release of fragrances

- volatility suppression
- **long-lasting fragrances**
- perfumes, room fresheners and detergents, diapers, menstrual products, paper towels, etc.

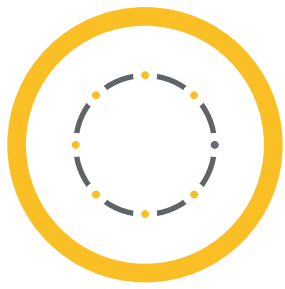
Masking odors and taste

- unfavorable **organoleptic characteristics** of some substances of the product **can be covered**
- CDs released into the environment can **bind molecules in the air/surface**, neutralising their odor

Preventing skin irritation

- CDs **alleviate local irritation** and reduce other side effects.
- CDs have advantages over other conventional penetration enhancers, such as fatty acids and surfactants.





CDs in cosmetic

Examples on the market - homecare

(Hydroxypropyl) Cyclodextrin

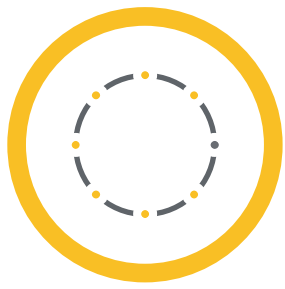
You know it as: a product made from sweet summer corn and potatoes

What it does: traps odors and locks them away (not just covering them up!)

Used in: [Fabric Refresher](#), [Air Effects](#)

P&G has been awarded **over 200 patents** on the application of CDs in fabric, homecare and health, beauty care





CDs in cosmetic

Examples on the market - skincare

Gel containing
peptides, hyaluronic acid, licorice



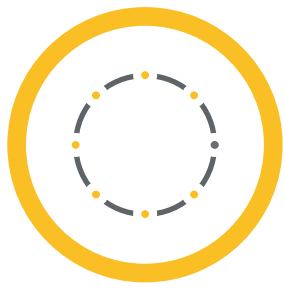
Serum containing
equol, daidzein, geinstein

Cyclodextrin at a Glance

- Derived from cornstarch and made via biotechnology
- Used in cosmetics to stabilize and help solubilize key ingredients
- Has absorbent properties when used at higher levels
- Helps keep delicate ingredients protected from light, air, and heat

Cream containing
shea butter and peptides





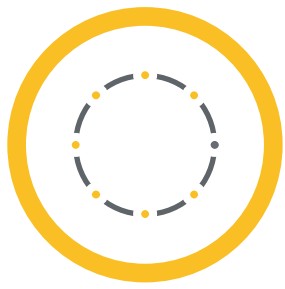
CDs in cosmetic

Examples on the market - haircare



Shampoo and sprays:
Emulsifier effect of CD

Dry Shampoo:
Cyclodextrins are 100% natural sugars derived from potatoes; they are used to blend natural active ingredients into our dry shampoo formula.



Utility of Cyclodextrins in Cosmetics

The possibilities are...

- **Vitamin C serums:** Cyclodextrins are often used to stabilize and solubilize vitamin C in serums, which helps to improve its effectiveness in brightening and evening out the skin tone.
- **Retinol creams:** Cyclodextrins can help to protect retinol from degradation and improve its stability, which can lead to better anti-aging results in creams and lotions.
- **Essential oil hair treatments:** Cyclodextrins can be used to encapsulate essential oils in hair treatments, which can help to protect the oils from oxidation and improve their efficacy in nourishing and strengthening the hair.
- **Natural extract moisturizers:** Cyclodextrins can be used to solubilize and stabilize natural plant extracts in moisturizers, which can help to enhance their moisturizing and antioxidant properties.
- **Sunscreen formulations:** Cyclodextrins can be used in sunscreen formulations to encapsulate UV filters, which can help to improve their stability and reduce skin irritation.

...endless.



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