

Ingredient Descriptions and Purpose

What does it mean to “dissolve?”

The following table provides an explanation of how each ingredient contributes to making the emulsion (lotion). Each chemical component (yes, these ingredients are definitely chemicals!) is described by the following terms:

Polarity: Describes the separation of an electric charge within a single molecule. Molecules can be *nonpolar* or *polar*.

Nonpolar the electric charge is equal throughout the molecule

Polar the electric charge is far enough apart to cause one portion of the molecule to have a positive charge and another portion of the molecule to have a negative charge (opposite charges in a single molecule)

Solubility: Describes the properties of a molecule that allow it to dissolve in a solvent. Solubility is related to the polarity of the molecule.

Hydrophobic molecules are *nonpolar* and are not soluble in water (polar molecule).

Hydrophilic molecules are *polar* and can dissolve in water.

An **Amphiphile** describes a molecule that has both nonpolar/hydrophobic and polar/hydrophilic properties. Greek in origin, amphiphile translates to “friendship.” In emulsions, an amphiphile helps to mix molecules that are normally immiscible.

Chemical Component	Polarity	Solubility	Melting Point*	Description & Purpose
Water	Polar	Hydrophilic	0°C	Chemical that is vital to all life on earth. Here, water will serve as the main portion of the continuous phases for our lotions.
Beeswax	Nonpolar	Hydrophobic	64°C	Produced by bees, this tough wax is a combination of fatty acid molecules that are bonded to alcohols containing long hydrocarbon chains. Beeswax is an increasingly common ingredient in skincare products due to its contributions to texture and moisturizing qualities.
Coconut Oil	Nonpolar	Hydrophobic	24°C	Extracted from coconut kernels, this oil has a

				very high saturated fat content (which is why it is solid at room temp.). It has a long shelf life compared to other oils, and helps give lotion a creamy texture.
Emulsifying Wax	Amphiphile		54°C	This vegetable-based product is a common chemical found in nearly all cosmetics. It serves as the bridge between hydrophobic and hydrophilic components, stabilizing the emulsion.
Oils (various unsaturated)	Nonpolar	Hydrophobic	-10°C	These vegetable-based chemicals are liquid at room temp. and are composed of long hydrocarbon chains. Oils help to provide a lustrous and smooth texture when making lotions.
Stearic Acid	Nonpolar	Hydrophobic	70°C	This 18-carbon saturated fatty acid is one of the most common fatty acids on earth. Highly enriched in shea and cocoa butters, this chemical helps to provide a “pearly” effect in cosmetics.
Glycerin	Polar	Hydrophilic	18°C	This colorless, odorless, viscous alcohol is widely used in cosmetic, food, and pharmaceutical industries. Its humectant properties helps to keep in moisture and provide lotion with a smooth, glossy texture.

*Under normal atmospheric pressure