

Formulating With Lecithin

[Lecithin](#) is a rather interesting ingredient. It has many uses, from emulsification to enhancing penetration of other ingredients, and more.

Lecithin is a by-product of the oil extraction process, particularly from soy and sunflower oils. Lecithin is also naturally found in eggs – and that’s why eggs can act as a binding or emulsifying agent in baking!

Emulsifier and Co-emulsifier

Lecithin has emulsification properties, and is ultra-natural. It is simply a by-product of the oil extraction process and doesn’t undergo any other modifications like most other emulsifiers do. So if you are into creating 100% natural, raw products, then lecithin may be a great choice.

Lecithin is also commonly found as an emulsifier in foods – its other name is E322.

Now, info on the internet is a bit sketchy for lecithin as a cosmetic emulsifier. Some say it is an oil-in-water emulsifier while others claim it is water-in-oil, others say it can be both. I agree with the last one, that it is both, although it can be a little tricky to work with.

Depending on the processing method, lecithin can create anything from thin O/W emulsions, which are ideal for serums, to much thicker W/O creams that are similar to body butters.

In the formulas later on in this blog, I have created two oil-in-water emulsions. They are lightweight and well absorbed, and they leave my skin wonderfully soft and moisturised for hours afterwards. I would highly recommend that you give lecithin a go!

Other Properties

Besides being a versatile emulsifier, lecithin has a number of other properties.

Due to its lipid content, it has a certain affiliation with the skin and can act as a penetration enhancer.

It is classed as a phospholipid, which is a fancy term for a complex fat (lipid) that also contains phosphoric acids, a nitrogen base, alcohol and fatty acids, and has a molecular structure consisting of a single hydrophilic (water-loving) 'head' and two hydrophobic (water hating) tails'. These amphiphilic properties give lecithin its emulsification ability.

Lecithin is a wonderful emollient and occlusive. That's right, you don't have to use it as an emulsifier. It can simply be added to products to boost the emollient and occlusive properties, thereby protecting the skin better. It is softening and replenishing, and leaves a wonderful, nourished skin feel.

Solubility

Lecithin is oil soluble. While it can be 'hydrated' and swell to an extent, it won't naturally mix with water unless processed in a specific way.

Skin Feel & Organoleptic Properties

Lecithin yields creamy and rich feeling products. I find it leaves a lovely smooth, silky and luxurious feel on the skin.

It is not a thickening wax like most emulsifiers. Lecithin won't contribute any viscosity to an emulsion so you need to control that with fatty acids, butters and other viscosity modifiers.

It tends to have a nutty scent, and is typically a deep caramel or brown colour. Keep this in mind when formulating as these properties can come through in the final product.

What Can You Make With Lecithin

Lecithin can be used in all kinds of creams, moisturisers and emulsion serums. Since it has emulsifying properties it can be used in all kinds of emulsions, although it does create a richer feeling product so you'll want to only use it in products where that sort of feel is required. You can use it as a stand alone emulsifier or as a co-emulsifier. I particularly enjoy it as a co-emulsifier!

You can also add it to anhydrous (oil-only) products. Try it in a lip balm for a lux skin-feel.

I really like a small amount of lecithin in any night moisturiser. It adds a touch of occlusivity and rich emolliency that really gives a nice feel. It also acts as a penetration enhancer, which is desirable if you have other actives. I use it at 0.5% for its penetration enhancing properties.

Usage Rate

0.5 - 10%

0.5% as a penetration enhancer.

0.5-2% as a co-emulsifier.

2-10% as a sole emulsifier.

Add lecithin to the heated oil phase of a formula.

How To Work With It

Making stable emulsions with lecithin as the sole emulsifier can be tricky but is doable with a little patience. The great secret is to drizzle in the water and oil parts veerrryyy slowly. So it's not like combining phases in a normal emulsion; lecithin takes a little more time and patience.

You also require heat - so make sure your phases are sufficiently hot and at similar temperatures to one another.

Lastly you need high shear. Please don't mix by hand or with an electric beater. You need to use a stick/soup blender.

Lecithin Plays Well With

Lecithin likes oils and oil based products. It also works really well with [lanolin](#).

It is great with oil soluble actives. Think [Vitamin A](#), [Vitamin E](#), [ascorbyl palmitate](#), [bisabolol](#), [Co Enzyme Q10](#) etc.

Formulas Using Lecithin As The Emulsifier

Here are two O/W emulsions made using lecithin as the sole emulsifier. The first is a thin emulsion serum, and the second has more of a classic moisturiser consistency. This demonstrates how versatile lecithin is!

I haven't provided a W/O emulsion as they are difficult to create (and also I don't really enjoy W/O emulsions as I find them too greasy!).

Lecithin Emulsion Serum

I'm showing you one way to process lecithin, by 'hydrating' it. This formula creates a lovely lightweight emulsion serum.

Phase A

3% [lecithin](#)

6% water, freshly boiled

15% [safflower oil](#), or another lightweight oil such as [almond](#), [apricot](#) etc

Phase B

4% [glycerine](#)

0.4% [xanthan gum](#)

70.6% water

Phase C / Cool down

1% preservative - I used [Euoxyl 9010](#)

Equipment

Soup/stick blender

Beakers

Spatula spoon

Hydrate the lecithin and 6% boiled water by stirring the two together in a beaker for 30 minutes. Like I said, working with lecithin requires patience!

While the lecithin is hydrating, mix the xanthan gum and glycerine together in a beaker to create a slurry, then add the water and blend to create a gel.

Once the lecithin has hydrated, trickle in the oil a few drops at a time, homogenising with the blender between each addition. Do not add it all at once or it will overwhelm the lecithin.

Now you have one beaker with oil and lecithin, and one with gel. Bring both up to 70 degrees, then trickle the lecithin mixture into the water mixture, homogenising as you go. Lastly, add in preservative once the emulsion has cooled below 35 degrees.

Check and adjust pH if required.

Pour into a serum bottle and enjoy!

Rich Lecithin-based Moisturiser

This moisturiser follows a more 'classic' emulsion making process, and the lecithin doesn't require hydration. This moisturiser is deeply nourishing and excellent for dry skin. It uses lanolin and butters.

Phase A/Heated oil phase

3% [lecithin](#)

1% [lanolin](#)

7% [butter of choice](#) - I used avocado butter

3% [cetyl alcohol](#)

4% [oil of choice](#)

Phase B/Heated water phase

75.2% water

5% [glycerine](#)

0.3% [xanthan gum](#)

Phase C/ Cool down phase

1% preservative - I used [Eueryl 9010](#)

0.5% [Vitamin E](#)

Weigh out and melt all the Phase A ingredients in a beaker.

In another beaker, mix the xanthan with the glycerine to create a slurry, then add the water and blend to create a gel.

Trickle the Phase A into gel mixture, homogenising with a stick blender as you go. Be sure to go slowly, adding Phase A bit by bit and homogenising in between each addition.

Once the emulsion has cooled, add in preservative and Vitamin E and blend through once more to incorporate.

Check and adjust pH if required.

Troubleshooting

Working with lecithin can be a little tricky at first, especially if you are very accustomed to working with easier emulsifiers. Patience and going slowly is key!

If you are seeing your mixture curdle after adding the oils to the water phase, it may be possible to save it. Reheat the whole thing and blend again. Keep blending with a stick/soup blender until a smooth emulsion forms. It may take a few minutes. But don't be discouraged if lecithin doesn't work for you on the first try. It is a more difficult emulsifier to stabilise.