

Formulating With Salicylic Acid

We are quite familiar with alpha hydroxy acids, but salicylic acid is slightly different. It is a beta hydroxy acid and has quite the personality. It is not easily soluble in most things, so requires some careful consideration to formulate with. Let's learn all about it.

[Salicylic acid](#) is a powerful anti-bacterial, anti fungal and anti-inflammatory agent used in skincare to combat acne, cleanse pores and provide exfoliation, and in hair care to combat dandruff, oily scalp and dirt. It reduces sebum production, dissolves skin debris that clogs pores and causes acne, and breaks desmosomes apart to allow new cell growth. It is great for oily skin types.

Usage

The FDA has approved salicylic acid up to 2%, so use 2% as your maximum usage. If you are new to salicylic acid I recommend starting with 0.5% and working your way up if required.

pH

Salicylic naturally has a fairly low pH of about 3, but it doesn't lose its efficacy at higher pH ranges, so it is advised to ensure the final pH of your product is around 4 which is more skin friendly.

Incompatibilities

As mentioned, salicylic acid has a pH of about 3 and does prefer an acidic environment, although the degree of it can be manipulated to an extent. That being said, I don't advise using it with highly basic ingredients or ingredients that prefer a basic environment as this may lead to reactions and irritation.

Salicylic acid can be irritating so I don't advise using it with other acids and AHAs, as this can increase the chances of irritation occurring.

What Ingredients Work Well With Salicylic Acid

Soothing ingredients such as allantoin, and humectants such as panthenol combine nicely with salicylic acid.

Solubility

Salicylic acid is picky about what it dissolves in, and how much.

Here are the solubilities of salicylic acid in different solvents:

14% in alcohol; ie 14g salicylic acid in 86g alcohol

Max 6% in propanediol; ie 6g salicylic acid in 94g propanediol

1.5% in glycerine; ie 1.5g salicylic acid in 98.5g glycerine

0.2% in water; ie 0.2g salicylic acid in 99.8g water

This means that you will only be able to dissolve a maximum of 14% salicylic acid in alcohol, 6% in propanediol, 1.5% in glycerine, etc. If you try to dissolve more then it will settle out.

If you use less propanediol to dissolve the salicylic acid, it will precipitate out when added to the rest of the formula as it won't have sufficiently dissolved.

Make A Salicylic Acid Stock Solution

I recommend making a 5% salicylic acid in propanediol stock solution if you plan to use it a lot. This will then save you time during the formulation process. As noted above, propanediol can take a maximum of 6% salicylic acid, so the 5% is within range.

To make your stock solution, combine 5% salicylic acid with 95% propanediol. Gently heat and stir to dissolve it, then bottle up and store it for future use.

To use your stock solution, follow these usage guides

For a 0.5% salicylic acid concentration in your final product: use 10% of the stock solution in your formula.

For a 1% salicylic acid concentration in your final product: use 20% of the stock solution in your formula.

Fortunately propanediol is extremely useful, non sticky and has humectant properties. So using it at 10% and up isn't too problematic. You can also make room for this amount in your formula by deducting from the water amount.

Formulas

Salicylic Face Wash

Incorporating salicylic acid into a face wash formula is pretty easy: simply substitute the glycerine/propanediol in the formula for the salicylic acid stock solution above.

10% of the 5% stock solution

0.75% [xanthan gum](#)

73.75% water

10% [cocamidopropyl betaine](#)

4% [oil of choice](#)

1% [Geogard 221](#)

0.5% [essential oil of choice](#)

[Beaker](#)

Scale

[Spatula](#) to stir with

[pH strips](#) / pH meter

Weigh out the stock solution into a beaker, then add the xanthan gum and mix to create a slurry. Blend in the water until a smooth gel is formed. Add the rest of the ingredients one by one, stirring well between each addition. I like to use a stick/soup blender to give everything a proper blend. Check and adjust the pH to around 4 if required.

Salicylic Acid Toner

10% of the 5% stock solution

80% water or [hydrosol](#) (I used grapefruit hydrosol)

1% [Geogard 221](#)

0.5% [allantoin](#)

0.5% [panthenol](#)

8% other water soluble ingredients: choose from extracts, hydrosols, or even more water or propanediol

[Baking soda](#) to adjust the pH to 4

[Beaker](#)

Scale

[Spatula](#) to stir with

[pH strips](#) / pH meter

If you haven't already made it, make up your 5% salicylic acid stock solution according to the directions above.

Weigh out the 10%, then add the water/hydrosol and stir to combine. Add in the Geogard, and then the rest of the ingredients one by one. Check and adjust the pH to 4 with the baking soda. Bottle up in a spritzer bottle and apply to the face as a toner after cleansing, or to the scalp as a scalp tonic.