All About Acid Exfoliation

Alpha-Hydroxy Acids (AHAs)

- Exfoliates *surface* of skin
- Great for dry, mature, or sun-damaged skin
- Water soluble – so it can penetrate the outermost epidermal skin layer
- Exfoliates and helps to soften and shed skin and improve skin tone and texture
- Stimulates collagen synthesis, firms, smooths and plumps skin and reduces appearance of wrinkles
- Act as humectants and encourage skin hydration
- Will not help with deep wrinkles

Can sensitize the skin to damaging effects of UV light. Always use with an SPF.

Beta-Hydroxy Acids (BHAs)

- Exfoliates *inside a pore*
- Great for oily or acne prone skin
- Lipid/fat soluble – so it can penetrate the underlying layers of skin.
- Exfoliates and helps to soften and shed skin and improve skin tone and texture
- Keeps pores clear and unclogged, thus reducing pore visibility
- Antibacterial and anti-inflammatory properties so it's good for acne and rosacea
- Can also help with milia and ingrown hairs
- Can be drying
- Will not help with deep wrinkles

Don't use if pregnant or breastfeeding
Don't use if allergic to aspirin.

Each type of acid has its own ideal pH —referred to as the pK_a value.
pH = pK_a has 50% free acid available

pK_a
Measure of acid strength and free acid availability

"Free acid" refers to unneutralized acid present in a formulation (think of it as an acid's "true strength")

COMMON AHAs

GLYCOLIC
- Strongest of AHAs
- Best for sun damaged skin
- Most effective at stimulating collagen production
- Hydrating

LACTIC
- Good for sensitive skin
- Most hydrating out of AHAs, particularly good for dry skin
- Works well with other AHAs

MALIC
- Good for sensitive or acne prone skin
- Moisturizing
- Often combined with other AHAs or to adjust a product's pH

MANDELIC
- Ideal for sensitive skin and rosacea
- Antibacterial properties: can unclog pores & treat acne
- Helps with skin brightening

pK_a & Typical Concentration

- pK_a 3.83 — **GLYCOLIC: Usually found in 5-15% concentrations (AKAs: hydroxyacetic acid, hydroxyethanoic acid)**
- pK_a 3.86 — **LACTIC: Usually found in 5-10% concentrations (AKAs: milk acid, hydroxypropanoic acid)**
- pK_a 3.41 — **MANDELIC: Usually found in 3-15% concentrations (AKAs: amygdalic acid, almond acid, benzeneacetic acid)**
- pK_a 3.40 — **MALIC: Usually found in 2-5% concentrations**
- pK_a 2.97 — **SALICYLIC: Usually found in 1-2% concentrations (AKAs 2-hydroxybenzoic, benzoic acid)**

Free Acid Concentration

To maximize effectiveness and reduce irritation, acid formulations should **target a pH roughly equivalent to the pK_a**

As the pH drops below the pK_a it becomes more effective *BUT* it will also become more irritating

For an acid with a pH that is 1 unit higher than its pK_a, only 10% of the original acid concentration is effective

How effective an acid is depends primarily on…
1. pH of the formulation
2. **The % acid included in product**
3. **the acid's pK_a**

A 5% glycolic acid at pH = 3.2 and a 10% glycolic acid at pH = 4.0 have about the same free acid available (and may be equally as effective), but the 10% with higher pH may cause less irritation on skin.

AHAs are often included in ingredient lists at low levels because these ingredients provide wide consumer recognition and a strong incentive to purchase, but they are often at too low a percentage and too high a pH to actual work as an exfoliant. Instead, they just moisturize.

AHAs: To exfoliate, and not just moisturize, look for pH below 4.0 with a concentration over 5%

AHAs: Look for a pH of 3.0-4.0 (*avoid pH lower than 2.5*) and a concentration between 4-10%

BHAs: To exfoliate the skin, and unclog pores, aim for a pH below 4.0 and a product percentage over 1%. (There is some evidence that salicylic acid is even effective at higher pH levels)

BHAs: Look for a pH of 2.0 to 3.5 and a concentration of 1-2%

Acid + Retinol? Using an OTC retinol or prescription retinoid with an acid, can be a great combination for skin. Retinol works by stimulating cellular turnover from the deeper layers (generating new healthy skin cells) and AHAs/BHAs work on exfoliating the uppermost layers. When used together they can give you great results, but they may also cause irritation for some (especially those with sensitive skin).

TIPS

- Acids work best when left on the skin (instead of in a cleanser).
- Certain cosmetic ingredients (like Glycerin) may interfere with the topical effects of an AHA by inhibiting permeation of AHA molecules.
- Some may prefer to use a blend of AHAs and/or BHAs to reap the benefits of each.
- Avoid anything that contains too much alcohol or other known irritants. They will exaggerate the already irritating effect of the acids. Look for **arginine** or **allantoin** in the ingredient list as these can help reduce irritation.
- If the concentration of the acid isn't provided, check that it is one of the first 5 ingredients that are listed.

GETTING STARTED

1. **Start at moderate concentration and don't overdo it (start with 2-3 times a week). Overuse takes a toll on skin. It can create thin, sensitive skin that is reactive.**
2. **Patch test new products (like inside of arm).**
3. **Use a daily sunscreen.**
4. **Be patient in between steps: Most common actives require a 15-20 minute absorption/activation window in the right pH to work to their full potential.**
5. **If you combine acids with a retinol, you may want to apply the acid in the morning and the retinol at night for the first few weeks so a tolerance can be built.**
6. **Consult a dermatologist if you are interested in a higher concentration acid.**

When to apply: After cleansing. If you use a Vitamin C, apply that first.

Incorporating a pH-adjusting toner before applying the acid may help boost product's effectiveness! [*Mizon AHA/BHA Daily Clean Toner is a good option*]

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