



A close-up photograph of a woman's face, partially obscured by a large, textured orange exfoliant mask. She is wearing a black top and has several white flowers tucked into her dark hair. The background is a soft-focus green.

Digest

VS.

Dissolve

A LOOK AT ENZYMES AND ACIDS
FOR EXFOLIATION

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There seems to be some confusion when it comes to the difference between acids and enzymes. The keywords in this difference are dissolve and digest. Many advertisements, articles and even some text books erroneously state that enzymes dissolve. The fact of the matter is enzymes digest and acids dissolve.

Choosing an Exfoliant

Regardless of the form of chemical exfoliation chosen, the benefits cannot be ignored. It is important to educate our clients about the decline of cell regeneration that comes with age. The shedding of corneocytes that used to take a month to turnover now remain glued in place for two to three months longer. This prolonged adhesion can cause a buildup of scaly flaky skin and a compromised barrier, leading to transepidermal water loss (TEWL). If bacteria is present, breakouts will also be present, even with mature skin. Broken and dilated capillaries exacerbate the issue, because the self-cleansing mechanism breaks down and oxygen cannot feed the cells. We need to explain the importance of revving up microcirculation and infusing antioxidants that neutralize free radicals. Clients so often think they have dry skin, when it is simply neglected and dehydrated.

Chemical exfoliation with acids is an effective anti-aging method, but it is simply not the best option for everyone. For sensitive skin, or those prone to hypopigmentation, enzymes are a more logical choice. There is strong evidence that telomerase activity is increased in the epidermis when skin is inflamed. It is important to read the skin's reaction each time it is exfoliated. A more gentle approach is needed when extended erythema, sensitivity and chronic dehydration are present, at which point enzymes would be the logical choice. This article will detail the activity of both acids and enzymes to explore which skin types and conditions each is appropriate for.

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Acids

Alpha hydroxy acids (AHAs) are an amazing tool for the skin care professional to keep in their arsenal. However, it is not as important as the tool of knowledge. AHAs include glycolic (hydroxyacetic) acid, which is an organic carbon-containing molecule.

When it comes to glycolic acid, it is important to always know your source, pH and percentage. Glycolic acid is generally derived from sugarcane, but it can also be sourced from fruits such as kiwi. It is hydrophilic and has a small molecular structure and weight. It penetrates deep within the upper layers of the epidermis, weakening the lipid bond (intercellular glue) and allowing the skin cells to be removed. There is a chemical process going on here, in reference to desquamation. This chemical process is believed to be caused by a reduction of calcium ions from cell adhesions.¹

In experienced hands, AHAs are amazing acids for anti-aging. AHAs speed up cell turnover, dissolve lipid bonds, stimulate the skin to produce collagen and, if used on a regular basis, fade hyperpigmentation, plump and hydrate to reveal softer, smoother skin. AHAs do not get rid of scars as some companies claim.

Estheticians use a higher percentage (up to 30%) and lower pH than consumer products. Everyday products need to be a minimum of 10% to be effective, but professional products over 10% are more apt to compromise skin health.

Glycolic acid causes biochemical reactions in the skin due to chemicals such as calcium oxalate. Only well

educated estheticians should use AHAs, specifically acids with a lower pH and a higher percent. Strong glycolic acids can also have some inhalation toxicity when used in high levels over long periods.

There are many limitations with stronger AHAs, such as sensitivity and Fitzpatrick type. Glycolic acid suppresses tyrosinase, which can cause a loss of pigment. Improper use in higher concentrations can, in rare cases, cause a lingering burning sensation, blistering and scarring. A mild lactic or malic acid is generally safe and beneficial and should not cause hypopigmentation. However, a product is only as safe as the practitioner that is administering it.

Enzymes

Enzymes are highly selective catalysts for so many processes in the body, where 75,000 of them can be found. Simply put, they speed up the rate of most of the chemical reactions within our cells. They are crucial for life itself and help to facilitate a wide array of key functions in the body (i.e. digestion and metabolism).

Facial enzymes generally come from the family of enzymes called proteases, or proteolytic enzymes (breakdown protein). When formulated at a lower pH, they are more effective at loosening the corneocyte cohesion (shedding of dead cells). The proteins are broken down into smaller polypeptides or single amino acids. The peptide bond is broken by hydrolysis (water). Yes, water severs the bond. No potential for toxicity there.

Enzymes are classified as chemical exfoliants; however, in my mind, they are biological catalysts that have a physical action—they break down or eat protein. Think of it like the little garra rufa fish that eat calluses off during a pedicure, only without any of the ick factor. Because enzymes digest, not dissolve, they have the ability to remove dead cells without drastically changing the pH of the skin or damaging barrier function.

Enzyme treatments are an effective, gentle way to keep cell regeneration moving. This clears a path for product penetration and allows oxygen to kill bacteria, fundamentally maintaining and improving overall skin health. Enzymes are so versatile, they can be used in conjunction with mechanical exfoliation and microdermabrasion.

Cleansers formulated with enzymes break up dirt and makeup without altering the pH, so hydration levels are maintained. You shouldn't notice a tight, irritated feeling



Glycolic acid is generally derived from sugarcane.



after cleansing, unless there are a lot of minerals (hard water). There are numerous sources for facial enzymes, each with its own beneficial attribute. Two of the most popular are bromelain, a proteolytic enzyme taken from the stem and juices of the pineapple, and papain, derived from papaya.

Bromelain. For centuries, bromelain has been used for home-care remedies and has been the topic of multiple studies on digestive disorders, dentistry and wound healing in general. Bromelain has also been associated with headache relief, where some find it as effective as over-the-counter NSAIDs. It is often used for its anti-inflammatory properties, treating soft tissue injuries and blood thinning capabilities. Hawaii, Japan and Taiwan have used bromelain for centuries for homeopathic remedies. Still today, it is used for wound care in some regions. It is a gentle exfoliator that has anti-inflammatory and antimicrobial properties. It contains an abundant amount of vitamin C, a potent antioxidant that targets hyperpigmentation, reduces redness by strengthening capillary walls, plays a vital role in collagen synthesis and aids in the natural cell regeneration process.

Papain. Derived from papaya, papain is known for its antioxidant properties of A, B, C and lycopene. Its flavonoids fight free radicals and help to protect against premature skin aging. A 2017 study stated that due to its prolific ability to remove damaged keratin buildup on the skin, it was suggested that it is a viable treatment for scarring.² It can decrease hypertrophic scarring and lighten post-inflammatory hyperpigmentation. The enzymes, betakeratin, vitamins and phytochemicals in papaya are thought to have skin lightening properties. It has also shown promise for topically healing skin ulcers. Researchers worldwide are looking at the benefits of papain for its healing properties. A 2012 systematic review of studies concluded that papain is effective and safe in treating many types of wounds in various stages of healing.²

Pumpkin. Pumpkin enzymes are popular and a great opportunity for seasonal promotional treatments. As

the air turns crisp and the cool winds begin to blow, the effects are noticed on the skin. People scramble for their pumpkin lattes, which dehydrate them further. They then book their pumpkin enzyme facials. Pumpkin enzymes contain vitamins A, B, C and E. Essential acids and vitamin E help to regulate sebum production, and vitamin B (niacin) helps acne. This combination is great for oily, congested skin. Pumpkin also contains the vital minerals, potassium and zinc to fight redness. Zinc is also an acne fighter. Pumpkin enzymes are also great for dry skin. The natural exfoliating enzymes are softening and hydrating. While this hearty fruit enzyme has many therapeutic and anti-aging benefits, it is highly active, so use caution with first time clients. If you would like to use it on sensitive skin, it would be best to buffer it, or choose papaya instead.

Berry enzymes. Blueberry and raspberry enzymes are packed with antioxidants. Blueberry, in particular, works great with acneic skin, as its active enzymes help soften



Bromelain is an enzyme that is taken from the stems and juices of pineapple.

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Chemical exfoliation, especially with acids, is a great option for treating aging.

sebacous material trapped within the follicles. It works great for normal and combination skin too; however, it is a bit too stimulating for sensitive skin or rosacea. Aside from being proficient at digesting excess keratin cells, raspberry does not get enough credit in my opinion. It is anti-inflammatory, anti-viral, antioxidant and a tyrosinase inhibitor, so great for compromised skin and unwanted pigmentation. The raspberry truly is a superfruit. It contains high levels of polyphenol antioxidant ellagic acid. It has one of the highest oxygen radical absorbance capacities (ORAC) of many fruits. Raspberries are loaded with vitamins A, C, B6, riboflavin, niacin, folate, magnesium, potassium, copper, calcium, zinc and manganese. The numerous minerals work masterfully in synergy with all of the vitamins.



Berry enzymes are packed with antioxidants.

There is a major benefit to using enzymes and acids together, since they exfoliate by the way of different mechanisms. One works on the buildup of dead protein cells, while the other works on intercellular cement. So synergistically, they become even more effective. As with any esthetic service, a thorough client consultation should rule out any allergic reactions, granted the practitioner knows the source of the products they are using. If due diligence is paid, the results should be very appealing. ✨

REFERENCES

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