What are All These Fuss Over PH?

The abbreviation, pH, stands for "Power of Hydrogen" or "Potential of Hydrogen". Both terms are correct. This is a measure of the activity of hydrogen or hydrogen ion content in a solution.

The pH scale measures how acidic or alkaline a product is, compared to pure distilled water. (which is pH 7.0)

Only wet substances have a measurable pH. The skin's pH is actually the pH on the skin's surface from the moisture within the skin, and the "acid mantle" which is part of the protective "barrier" on its surface. Hair for example has no pH.

(The acid mantle is a fine film layer, slightly acidic, made up from skin oils, sweat, and dead cells. It is one means the skin uses to protect itself from bacterium, and moisture loss, and environmental damage. Pollutants, harmful bacterium, contaminants are normally alkaline in nature, so a slightly acid skin surface helps fight off these harmful elements and prevent them from entering into, and damaging the skin. Maintaining the acid mantle is recommended for good skin health. When the acid mantle is damaged it takes approximately 14-17 days to repair itself. (assuming no other damaging products are applied to it)

A damaged acid mantle leads to a number of skin issues, such as over dry skin, dehydration, over oily skin, flaky skin, acne, sensitivity etc. It would require another long article to detail all this. But incorrect pH products can contribute to acid mantle degradation, and increases in acne causing bacterium on the skin. (More on this below)

The pH Scale

The pH scale goes from 0-14, this covers most wet substances, though some substances can be extreamly acid or base, and go beyond this scale. But for skincare products, you will not be using these.

-Acids have pH values under 7 - they are more acidic then water (acid)
-Alkalis have pH values over 7 - they are more alkaline then water (base)
-If a substance has a pH value of 7 - it is neutral, like water, (neither acid nor base)

The difference between one pH, is one unit of measure, and represents tenfold, or ten times the change.

Each whole number below 7 is ten times more acidic then the next higher number. (6.0 to 7.0 for example) Each whole number above is ten times more alkaline.

The segments between each whole value are divided into increments of 10ths. Not increments of one. Similar to the way a ruler has both inches, and 16ths of inches divisions between each inch marker (5.0, 5.1, 5.2, 5.3 . .) .

For example, a cleanser with a pH of 6 is ten times more alkaline than a cleanser with a pH of 5.

A cleanser with a pH of 7 is 100 times more alkaline then one of 5.

Skin pH is 4.5 to 5.5, which is a recommended cleanser range, for best skin health.

Because of this, only a few units of pH can make a big difference in how a product or your skin reacts.

(A pH scale tells you if a product is more acid or alkaline/base. 7 is neutral - it is equally acid and base. Any number less then 7 is acidic, any number higher then 7 is alkaline)

pH Examples

Some pH examples:

pH 1 battery acid - (acid extreme)
pH 1.5 -2 = Gastric (stomach) acid
pH 2 = lemon juice
pH 2.5 = Cola soft drinks
pH 3 = vinegar
ph = 3.5 Orange Juice
pH 4.6-5.5 = healthy skin
pH 5.5 = rain, (pure water, when exposed to the atmosphere, will take in carbon dioxide, changing its pH)
pH 6.5 = milk
pH 6.5 – 7.4 = Healthy Saliva
pH 7 = pure distilled water - (this is Neutral pH, neither acid or base)[/color]
pH 7.35 – 7.45 = human blood
pH 8.5 = baking soda
pH 9 = Sea Water
pH 9.0-10.0 = Hand Soap, detergents
pH 10.5 = Milk of Magnesia
pH 11.5 = household ammonia
pH 12.5 = household bleach
pH 13 = lye (sodium hydroxide, or Draino)(Alkaline or Base extreme)

Skin, and the Acid Mantle

Newborn baby skin has a pH of 7. (it is neutral)
Within a few months it adjusts to a more "normal" pH of 4.5 to 5.5. This allows their skin to be more resistive to bacterium.

Adult skin is normally slightly acidic, a range of 4.5 to 5.5. Different body areas can differ some in pH, and disease and acid mantle damage can alter pH. But the preferred range for facial skin pH is 4.5 to 5.5.

Those with skin disease, skin problems, and stressed skin usually have a skin pH over 6.0. Aged, stressed and damaged skin have more difficulty maintaining a "correct" pH.

As skin pH raises closer to pH 7.0 it becomes less able to function optimally and to kill bacterium. This allows acne causing bacterium to multiply rapidly on the skin surface. Acne bacteria are found on everyone's skin, even if you never have a pimple in your life. If you are acne prone, the number of bacterium is greater on your skin. So you have more breakouts. Many things contribute to acne, and can be changed to adjust it.

The damaged skin is unable to "manage" the excess bacteria, and they multiply rapidly. Bacterium growth is very slow at pH of 5.5 or less- but a slight shift upward/higher, toward the alkaline levels, causes a marked increase in the reproduction and lifespan of acne causing bacteria.

So if your skin is at a higher pH (anything over 6, as damaged skin often is) the acne causing bacteria can multiply much easier and faster. Often faster then your skin can handle. That is a separate post though. Just remember skin pH is one main contributor to acne.

Skin pH also has an effect on how irritable skin is, how well it ages, and how it deals with product and environmental stress. This is why it is recommended you cleanse skin with mild, non-irritating products, as close to the skins natural pH as possible. (5.5)

Many commercial cleansers are very alkaline, which also changes the skins pH to alkaline levels on the skin surface, for a short time. Many alkaline cleansers(such as those containing Sodium Lauryl Sulfate and Sodium Laureth Sulfate) are in the same pH range as baking soda, and some are as high as ammonia. This is very harsh on the skin, and can lead to increased irritation, acne, moisture loss, skin aging etc. This allows the bacterium to have a party. With the damage to the acid mantle, the bacterium growth continues unchecked.

As pimples erupt, the skin is less able to heal the zits, or the damage they leave behind. Oil flow increases to try and help balance the barrier, dryness, flakiness, rashes, sensitivity and irritation can also become a problem. All are related to skin that is very stressed, and unhealthy, and cannot balance itself.

If a product has a high pH and a larger percentage of a strong irritant detergent ingredient cleanser like sodium lauryl sulfate, or irritant ingredient like peppermint oil or menthol, because of the pH destructive activity on the acid mantle, the detergent can contribute to even more damage then it would if the product pH was closer to 5.5. It literally takes a split second for an alkaline product to degrade the skin barrier enough for an irritant or damaging detergent to penetrate. Some people can handle this better then others, but long term daily use on the skin can contribute to long term issues on all skin types. As skin ages, or the barrier function degrades, it has more difficultly dealing with this type of stress.

Even after 20 min or so, when the skin re-adjusts to its more normal pH (4.5 to 5.5) - it is already damaged, irritated and stressed.
The damage recovery involves longer term healing. 14 to 17 days for acid mantle repair.

This continued long-term damage, stress, and mild irritation, can prevent the skin from maintaining its best pH level of 4.5 to 5.5. With time, and increased damage, it may tend to stay at the 6 range or higher.

As skin become healthier, its pH values lower, and acne growth also lowers. Oil production, dryness, etc all become more "normal" and regulated.

A product may include the term "pH Balanced" on the label. This ONLY means it has a pH of 7.0 or neutral, it is "balanced" between 0-14. Not that is has a pH the skin likes of 5.5. The term has no legal definition. So can be used to mean anything from 5.5 to 7.0.

Some products are a good pH, but high in irritants. Which is better then high pH and high irritants, but not great either.

A good cleanser cleans the skin without stripping it, and without breaking down the acid mantle, or adding irritants to the skin. It is mild with a 5.5 or lower pH.

How do you tell whether a cleanser is good?

- *No tight, dry feeling on the skin after use.*
- *No uncomfortable residue.*

Skin feels clean and soft.