

Vitamin C in Personal Care Products

Clinical Facts vs. Marketing Hype

You have probably read or heard of the many new skin care products with “stabilized Vitamin C.” How do you distinguish the facts from the marketing hype? First and foremost, you must understand that all vitamin C skin care products are NOT created equal. Just because vitamin C is included in the ingredient list does not indicate the product has the ability to deliver the incredible benefits of the ascorbic acid form of Vitamin C.

The most significant benefits demonstrated in clinical studies using Vitamin C have used the ascorbic acid form of Vitamin C in a percentage of no less than a 10% water based solution with an acidic pH preferably around 3.

The problem with the ascorbic acid form of Vitamin C is that it does not remain stable and active very long after it is dissolved in a solution. And yet, it is a water soluble vitamin. It actually turns to a form of sugar and over time will “caramelize” and turn from a clear to yellow and eventually a brownish color indicating it is no longer active. Some research now indicates that once it is brown it is actually comedogenic and can be the cause of problems for skin. Therefore, the race for companies’ R&D has been to find ways to stabilize ascorbic acid in a liquid form so that cosmetic creams and lotions can deliver the benefits of Vitamin C with an extended shelf life. The challenge seems easy to understand and logical.

There exist four fundamental approaches to delivering Vitamin C to the skin and/or hair. All of them begin with the basic form of ascorbic acid, the form of vitamin C used in nature.

- 1. Self-activation of Ascorbic Acid** - Mixing pure nature identical ascorbic acid form of Vitamin C in a water based solution with or without other ingredients and using this compound within a relatively short time (weeks unless it is maintained much like a food grade product in the refrigerator).
- 2. Derivatives of Ascorbic Acid** - Ascorbyl (Alcohol Form) - Synthesizing the original ascorbic acid form of Vitamin C into an alcohol form (ascorbyl) pre-mixed into an emulsion of lotions, creams or serums.
- 3. Hydro-Alcoholic solution** - Mixing the ascorbic acid form of Vitamin C in an alcohol solution rather than exclusively water so the ascorbic acid form of Vitamin C does not break down as quickly.
- 4. Liposomes** - Surrounding and protecting micro-sized particles of the ascorbic acid form of Vitamin C so the particle sized vitamin is still dry until it is applied to a surface, such as skin, at which time it would dissolve and become active.



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Form of Vitamin C	Identification by category or compound (INCI name)	Pros	Cons	Comments
Self - Activation	Ascorbic Acid	Activated by user to guarantee the potency for significant benefits. Delivers higher percentages of Ascorbic Acid in the correct pH to meet clinical standards.	If not used as directed, the vitamin can break down and lose potency in weeks when not stored in a cool environment.	Most effective form of vitamin C skin care due to the fresh activation of pure ascorbic acid, the high percentage and the control of pH. Example: Malibu C
Ascorbic Acid Derivatives Ascorbyl - Alcohol Form of Vitamin C (ending in "yl" or "ol" indicating it is the alcohol form, but not formulated in an alcohol solution) of Vitamin C	Ascorbyl Palmitate Magnesium Ascorbyl Phosphate Sodium Ascorbyl Phosphate	Somewhat stable for a limited time.	According to RTD Technical Data, formulas utilizing derivatives of Ascorbic Acid are far less supported by clinical evidence and do not directly provide the free radical quenching benefits desired. <ol style="list-style-type: none">1. They will eventually break down providing little or no activity.2. No way to determine the shelf life for activity.3. Relatively low percentage of the actual vitamin C.4. Percentage of Vitamin C is usually suggesting percentage of total compound and the amount of Vitamin c is usually around 1%.5. Usually formulated in pH over 66. Relatively expensive if in percentage over 1% Vitamin C.	Researchers have found that once this form has been mixed into personal care solutions, the total shelf life is approximately 6 months.
Hydro-alcoholic Formulated In Alcohol Solution	Hydro-alcoholic solution with ascorbic acid form of Vitamin C	Relatively stable vitamin C in liquid form for a limited period of time.	<ol style="list-style-type: none">1. Will eventually break down with little or no activity2. No way to determine the shelf life for activity3. Many users will have a stinging reaction to skin4. Will turn brown quickly when exposed to heat.	One of the more popular forms of serums, but clients do not seem to stay on it for long as the cost is usually over \$80 an ounce.
Liposomes Surrounded & protected micro-sized particles then formulated in a traditional emulsion personal care product	Liposomes, nanosomes, silicones	More stable vitamin C in micro-sized particles compounded in products.	<ol style="list-style-type: none">1. Very low percentage of the actual vitamin C2. Expensive if used in percentage of over 1% Vitamin C3. Can eventually break down with little or no activity4. No way to determine the shelf life	Good concept – but still too new to assess feasibility.