Disadvantages of Alcohol Based Hand Sanitizer Products

Two kinds of alcohols used in skin-care applications:

Ethyl alcohol (Grain Alcohol):

A low-molecular weight alcohol containing two carbon atoms.
Same alcohol as consumed in alcoholic beverages.

Isopropyl Alcohol (Rubbing Alcohol):

A low-molecular weight alcohol containing three carbon atoms.

These alcohols are toxic to microorganisms. They precipitate proteins in the outer surface of these organisms, killing them on contact. The effective concentration range of these alcohols for killing microorganisms is generally 60-100%.

Negative Aspects of Alcohols When Used in Skin-Care Products:

- Alcohols are excellent solvents:
  Alcohols are often used as industrial cleaning solvents, because of their ability to dissolve oils and remove them from surfaces. The residual alcohol also evaporates quickly from the cleaned surface. While this is good for circuit boards and metal surfaces, the same properties are irritating to skin. The natural oils are removed from the skin, often called "defatting" of the epidermal layer. Extended use will keep the natural oils from protecting and softening the skin, often resulting in dried or cracked skin. To avoid this irritation, some skin-care products include "emollients," to help replace natural skin oils. These emollients are often very different from the natural oils on the skin.

- Alcohols evaporate rapidly:
  When the concentration of alcohol drops below 60% in the applied solution, its antibacterial action is impaired. The FDA states that when the alcohol concentration drops below 60%, it is no longer effective as an antibacterial agent. Within seconds after applying to the skin, the alcohol evaporates, decreasing its concentration rapidly. Within a few seconds, the applied product is no longer effective. And, there is no continued antibacterial action. As such, alcohol solutions offer no persistence.

- Alcohols are flammable:
  Alcohols burn rapidly. High-performance racecar engines burn low-molecular-weight alcohols, because of their excellent flammability. When alcohols vapors are mixed with oxygen gas, the mixture is explosive. Imagine having alcohol spread across the skin, with evaporating alcohol vapors mixing with the air above the surface of the skin, and having a spark ignite the alcohol. There are many horror stories of this happening, especially in oxygen-rich environments.

- Alcohols have a peculiar odor:
  Due to their high volatility, rapid evaporation fills the air with alcohol molecules that have a distinctive and peculiar odor. This characteristic of alcohols may be positive or negative to the consumer, however, more often than not, the user finds this offensive.