The Science of ONA

The ONA odour neutralising products consist of complex formulations representing a variety of chemical compounds offering different functionalities, both structural and chemical. The technology behind ONA Odour Neutraliser was initiated over 25 years ago. The scientist who invented ONA became fascinated when he observed that terpenes, when diffused into the environment, reduced odours and unwanted emissions.

Inspired by this finding, further evidence showed that the odours were not just masked but permanently removed. The result was a set of specialized formulations that neutralise a wide spectrum of organic and inorganic odour problems — effectively, efficiently and permanently.

ONA formulations have been scientifically engineered to be environmentally safe. ONA is manufactured under strict quality controls to ensure a safe and non-toxic product. The components used to make ONA are generally recognized as safe and have been commonly used in the food and cosmetics industries with a long history of safety.

TERPENES

Terpenes are widespread in nature, mainly in plants as constituents of essential oils. Many terpenes are hydrocarbons, but oxygen-containing compounds such as alcohols, aldehydes or ketones (terpenoids) are also found. Their building block is the hydrocarbon isoprene,

$CH_2=C(CH_3)-CH=CH_21$.

TERPENE CHARACTERISTICS

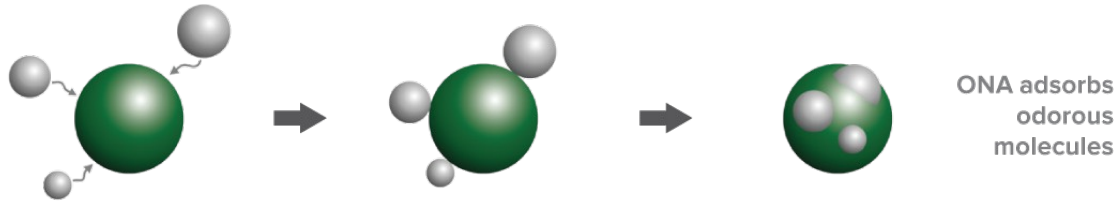
- Terpenes have anti-bacterial, antifungal and antiseptic properties.
- Terpenes have oxygenating properties (increases oxygen level).
- When diffused into the environment, terpenes have been found to reduce airborne chemicals and bacteria.
- Terpene characteristics appear to either destroy the odour molecule or convert it to a more acceptable level.

THE MECHANISMS OF ACTION

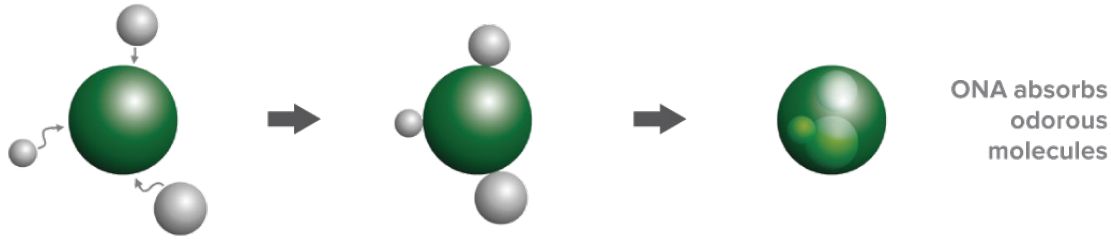
There are three mechanisms of action that can occur, based on the chemical and physical natures of each terpene and active ingredient
versus the organic and inorganic volatile compounds.

Adsorption — All VOCs and odorous compounds have a solubility factor in ONA active ingredients. This solubility will allow the VOC compound to solubilize itself in the presence of ONA, relative to the chemistry of the emission, temperature, pH, and pressure of the environment.

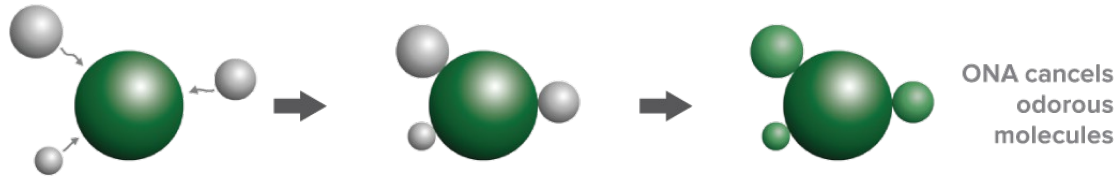
Adsorb: To collect and hold (gas or vapor) in the surface of a solid.



Absorption — The active molecules in ONA will attract or come into contact with low molecular weight or volatile compounds (VOC's). These VOC's will enter and bond with the ONA active ingredients to eliminate odours.
Absorb: To retain wholly, without reflection or transmission, what is taken in.



Chemical Reaction (The Pairs Theory2) — This involves the permanent bonding of the odorous molecule (VOC) and the ONA active ingredients reactive sites. This mechanism transforms the pollutant in its basic properties. As a result, odour disappears.



The affinity of the different odorous compounds (VOCs) with ONA is directly relative to their chemical composition and physical state. For example, a hydrogen sulfite can have a great affinity for certain sites of the ONA active ingredient. It can either bond electrostatically, or react in comparison to its relative solubility. This means different components will be neutralised by one mechanism compared to the other two, or a blend of each of the three.
The bottom line is ONA is not a masking agent but offers a safe, effective way to permanently eliminate odours and emissions.
1 Isoprene Rule, Wallach 1887
2 The Pairs Theory is based on the work of Zwaardermaker, an early 20th century Dutch scientist. The Zwaardermaker Pairs Theory concludes that two or more odours can cancel each other out when they combine in a natural bond like attraction.