Effects of hydrophobic length on melting temperatures in lipids

**Question 1.**

**How does UV-Ozone work?**

During the surface preparation the Au-coated quartz sensors were cleaned by immersions for 5 min in a 5:1:1 mixture of milli-Q water, ammonia and hydrogen peroxide heated at 75º, subsequently rinsed in milli-Q water and dried with N2. Shortly prior to the beginning of the QCM-D measurements, Au sensors were exposed to UV-light for 15 min using a UV-ozone cleaner (Bioforce Nanosciences, Wetzlar, Germany).

**The Uv-Ozone cleaning is generally effective for removing organic contaminants.**

How it works properly?

Organic compounds are converted into volatile substances (e.g., water, carbon dioxide, nitrogen) by decomposition by ultraviolet rays and by strong oxidation during the formation and decomposition of O3 and are removed from the contaminated surface. The major wavelengths of the ultraviolet rays radiated from a well-known low-pressure mercury vapor lamp are 184.9 nm and 253.7 nm. When atmospheric oxygen O2 is irradiated with ultraviolet rays with a wavelength of 184.9 nm, the oxygen absorbs the ultraviolet rays to form O3 by the following reaction:

Ultraviolet rays with a wavelength of 189.4 nm

O2 - > O + O

O + O2 -> O3

Ozone O3 irradiated with ultraviolet rays with a wavelength of 253.7 nm absorbs the ultraviolet light to decompose O3. During the process of formation or decomposition of O3, atomic oxygen O having a strong oxidizing ability is generated. Then, contaminant organic compounds are irradiated with ultraviolet rays, and absorb the ultraviolet rays to cause photolysis and generate the following substances:

Organic compounds irradiated with ultraviolet rays:

* Ions
* Free radicals
* Excited molecules
* Neutral molecules

**Application of UV-O3 cleaning**

In the manufacture of crystal oscillators, surface contamination significantly affects the performance of the oscillators. The frequency change of a crystal oscillator with a frequency of 5 MHz must be 2/1010 or less in a week, but the adsorption or desorption of monolayer contamination on the surface causes a frequency change of 1/106. Therefore, contaminations equal to or less than monolayer or smaller must be removed; UV-O3 cleaning has been used for this purpose.UV-O3 cleaning is highly effective in removing organic contaminants from gold surfaces, and significantly decreases the temperature dependency of thermo-compression wire bonding. Thus, this cleaning method is used to improve the reliability of wire bonding at low temperatures.

Here we have some contaminants removable bt UV-O3 cleaning:

1. Cutting oils

2. Mixtures of beeswax and pine resin

3. Lapping agents

4. Vacuum-pump oils

5. Silicon diffusion-pump oils

6. Silicon vacuum greases

7. Soldering fluxes

8. Human sebum

9. Contaminants adsorbed during long-term air

exposure

10. Carbon thin films formed by vacuum

Evaporation

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