Summary of Methodology

This document is a summary of the methodology employed in the analysis of Kombucha beverages for Alcohol by Volume (ABV) content. This summary is in no way intended to be absolute. It is however an accurate and defensible technique for low levels of Ethyl Alcohol detection.

Matrix Issues

Kombucha beverages present several matrix interferences that make ABV analysis difficult. The alcohol levels are typically lower than that of beer and wine. They contain high amounts of dissolved and suspended solids. They contain high concentrations of organic acids.

Alcohol Industry Methods

Current ABV analysis techniques in the beer and wine industry include Hydrometer, Refractometer and Anton Paar NIR. The issues with these techniques regarding Kombucha beverages is that they are less accurate at ABV levels below 2%, are unable to take into account the high concentration of organic acids and do not perform well on samples with high dissolved and suspended solids.

GC/MS Headspace Gas Chromatography

GC/MS Headspace Gas Chromatography uses the most current technology available through a dynamic headspace technique. This technique employs a continuous extraction process. The fully automated technique allows for more sensitivity which leads to lower limits of quantitation. The schematic below is a representation of this process.
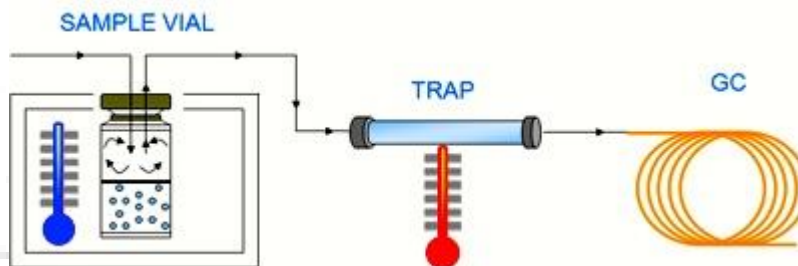
Dynamic headspace schematic. The volatile components of a sample are continuously removed and placed on a trap, which is then heated to send volatile components off of the trap and onto a column.

The above process then sends the volatile components to a Mass Spectrometer for detection. The Mass Spectrometer pinpoints the Ethanol by its unique fingerprint Mass Spectra thus eliminating interferences.

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