

WINE FAULT SOLUTIONS

PRODUCT

Product No. 4A190. 6 Solutions for spiking wine samples for olfactory sensory assessment *only*.

CONTENTS

Solution	Compounds	Concentration	Volume (mL)	Approx. Wine Threshold Rate
1	4 Ethyl Phenol 4 Ethyl Guaiacol	50,000ug/L 5000ug/L	35	400µg/L 40µg/L
2	Guaiacol 4 Methyl Guaiacol	2500ug/L 2500ug/L	35	20µg/L 20µg/L
3	Acetic Acid	100g/L	35	0.8g/L
4	Acetaldehyde	15g/L	35	120mg/L
5	Ethyl Acetate	15g/L	35	120mg/L
6	TCA	5000ng/L	35	30ng/L

SAFETY

- Solutions are for use only to spike wine samples for olfactory assessment. Do not ingest solutions or wine samples containing these solutions.
- All solutions contain compounds which are known irritants and may be extremely harmful if swallowed.
- Solution 3 contains a compound which may cause severe burns.
- Solution 4 contains a compound which may be carcinogenic.
- Do not spike wine samples more than five times the approximate wine threshold rate.

INSTRUCTIONS

Spike a known volume of wine sample with enough fault solution to obtain the desired final concentration of fault compounds in the wine, using the following formula:

$$\text{Volume of Fault Solution to add (mL)} = \frac{\text{Desired Concentration (}\mu\text{g/L)} \times \text{Wine Volume (mL)}}{\text{Fault Solution Concentration (}\mu\text{g/L)}}$$

For example, to spike a 500mL wine sample with Solution 1 to obtain a concentration of 400µg/L 4 Ethyl Phenol:

$$\begin{aligned} \text{Volume of Fault Solution to add (mL)} &= \frac{400\mu\text{g/L} \times 500\text{mL}}{50,000\mu\text{g/L}} \\ &= 4\text{mL} \end{aligned}$$

Alternatively, a spreadsheet with this formula is available for download at www.vintessential.com.au

FAULT SOLUTION INFORMATION

Solution 1

4 Ethyl Phenol and 4 Ethyl Guaiacol are metabolic by-products of *Brettanomyces*, a wine spoilage yeast. Typical sensorial descriptors for its adverse affects on wine include horsey, sweaty saddle, barnyard or medicinal/bandaid.

Solution 2

Guaiacol and 4 Methyl Guaiacol are found in wine either as a contribution from toasted oak barrels, or from excessive exposure to smoke generated by bush-fires. Typical descriptors include smoky, spicy or bacon. With regard to smoke taint from bushfires, Guaiacol and 4 Methyl Guaiacol are marker compounds for excessive exposure to smoke, however additional compounds in smoke are also thought to contribute to the taint.

Solution 3

Acetic acid is the main volatile acid in wine and has a vinegar aroma. It is formed during alcoholic fermentation and also by *acetobacter* spoilage under aerobic conditions. The legal limit of volatile acidity in Australian wine (expressed as acetic acid) is 1.5g/L.

Solution 4

Acetaldehyde is involved in the fermentation pathway and is reduced to form ethanol. Some Acetaldehyde may remain in the wine following fermentation. The concentration can also increase as wine ages and a slow chemical oxidation of ethanol to acetaldehyde occurs. If free sulphur dioxide is present in wines, it reacts with acetaldehyde to form bound sulphur dioxide. Acetaldehyde concentrations above the sensory threshold impart bruised apples, sherry and nutty aromas.

Solution 5

Ethyl Acetate is formed in wine through the reaction of acetic acid and ethanol. At low concentrations, ethyl acetate can impart a richness and sweetness to certain wines, however at higher concentrations above the sensory threshold level, it imparts the aroma of nail polish remover.

Solution 6

2,4,6 Trichloroanisole (TCA) is a compound associated with cork taint. It is formed in some corks via chlorination of phenols and fungal activity. TCA has a very low sensory threshold and wines affected by this compound have a musty, mouldy, wet-cardboard off-flavour.