

OXIDIZED AROMA SCREEN: ACETALDEHYDE

The following is adapted from Zoecklein, et al. (1999)

Acetaldehyde is the principal aldehyde present in wine. It is produced as an intermediate during alcoholic fermentation and as a result of oxidation of ethanol during wine storage. The levels normally encountered in newly fermented table wines is < 75 mg/L with sensory thresholds ranging from 100 to 125 mg/L.

Above this range, acetaldehyde can impart an odor to the wine described as overripe, bruised apples, sherrylike, and/or nutty. Sulfur dioxide (bisulfite) rapidly reacts with acetaldehyde producing an addition product (hydroxysulfonate), which has limited volatility and therefore odor. The following screening procedure for acetaldehyde uses sulfur dioxide binding as a means of helping to mask excessive acetaldehyde present in wine.

This procedure can be used to help determine if the loss of varietal character may be due to wine oxidation.

Procedure:

1. To 100 mL wine samples add 5, 10, 15, 20, and 25 mg/L sulfur dioxide, as per the Table below.

Table 1. Volumes of stock 1,000 mg/L SO₂ solution for 100 mL volumes of wine.

Volume (mL) of stock SO ₂ /100 mL wine	Approximate SO ₂ concentration in wine (mg/L)
1	10
1.5	15
2	20
2.5	25

2. Let wine stand for approximately 10 min, pour samples into wine glass, and evaluate wine odor compared to an untreated control.

Interpretation: Reduction of overripe, bruised apple/sherry, or nutty like odor is indicative of acetaldehyde. Specific analysis procedures for acetaldehyde are provided below in this chapter.

II. Supplemental Note

1. 44 mg/L acetaldehyde binds with 64 mg/L sulfur dioxide or 1 to 1.45 ratio.
2. High acetaldehyde levels are responsible, in part, for high bound and low free sulfur dioxide.