

# Tartaric Acid

Product # TA-F40 (20 Tests), TA-F120 (60 Tests)

## Amm-Vanadate Colorimetric Method for wine

### INTENDED USE

This Tartaric Acid reagent (Ammonium Vanadate method) is intended for the determination of tartaric acid in wine or fruit juice.

### DESCRIPTION, ACCURACY

This colorimetric Tartaric Acid reagent is the Ammonium Vanadate method. In the presence of Tartaric acid, an colored metapervanadyl tartrate complex is formed which is read photometrically. The reagent is specific for Tartaric Acid and is linear between 1 and 6 G/L.

### REAGENTS

All reagents are liquid and ready to use.

	Quantity (mL)/Kit	
	20T	60T
Reagent #1	40	120
Reagent # 2	10	30
Tartaric Acid Std, 5G/L	2	7

### STORAGE & REAGENT PREPARATION

Components are stable until the labeled expiration date when stored in original container at room temperature (15-30°C.)

### SAMPLE PREPARATION

#### Clarification

Turbid samples should be filtered or centrifuged prior to analysis.

#### Decolorization

Red wines with total polyphenols > 3G/L should be decolorized (e.g. mix 10 mL juice and approximately 0.1 g polyamide powder or polyvinylpoly-pyrrolidone (PVPP), stir for 1 minute and filter.)

### PROCEDURE

**System parameters:** Wavelength 492 nm  
Absorbance Range 0-2.0A at 1cm pathlength.

**Prepare Standard Curve:** Dilute the 5 G/L Tartaric Acid Standard, provided, as shown below:

- 5 G/L Std. (undiluted, as provided)
- 3 G/L Std. (180 uL 5G/L Std. + 120 uL D.I. Water)
- 1 G/L Std. (60 uL 5G/L Std. + 240 uL D.I. Water)

**Protocol:** Label one cuvette for Reagent Blank, each Standard and Sample.

1. Pipet 100 uL standard, samples, and water into cuvettes, as shown on the following table, using micropipettes.
2. Zero the spectrophotometer using D.I. water

3. Add Reagent 1 to each reaction cuvette (per table.) Mix and wait 1 min. Read Initial ABS (492nm).
4. Dispense Reagent 2 into each reaction cuvette. Mix, wait 5 minutes. mix each cuvette and read final ABS.

Pipet into ...	Blank Cuvette	Standard Cuvette	Sample Cuvettes
DI Water	100 µL		
Standard		100 µL	
Sample			100 µL
Reagent 1	2 mL		
Mix and wait 1 minute Read initial absorbance (A <sub>i</sub> ) of each cuvette.			
Reagent 2	500 µL		
Mix and wait 5 minutes MIX cuvette again prior to reading Read ABS <sub>FINAL</sub> of each Cuvette			

### CALCULATIONS

1. Calculate Delta-A values for Rgt Blank, each Standard & Sample: **DeltaA** = ABS<sub>FINAL</sub> - (ABS<sub>INITIAL</sub> \* 0.808)  
(The 0.808 factor corrects for Rgt 2 Volume change.)
2. Calculate **Net-A** for each Standard & Sample:  
**Net-A<sub>SAMPLE</sub>** = **DeltaA<sub>SAMPLE</sub>** - **DeltaA<sub>REAGENT BLANK</sub>**  
**Net-A<sub>STD</sub>** = **DeltaA<sub>STD</sub>** - **DeltaA<sub>REAGENT BLANK</sub>**
3. Determine Tartaric Acid (G/L) through interpolation or spreadsheet calculation from the standard curve.
4. L-Malic Acid causes a negative interference which is quantitatively corrected using Malic (G/L) values as follows:  
**Tartaric Acid<sub>CORRECTED</sub>** = Tartaric Acid + (Malic Acid \* 0.15)

### LINEARITY

This method is linear between 1 and 5 G/L  
**Sample Dilution:** Samples higher than 5 G/L should be diluted with deionized water and re-assayed. Multiply the calculated G/L result by the dilution factor.

### SIGNIFICANCE OF MEASUREMENT

Total acidity is the content of the total organic acids concentration in wine (e.g. Tartaric, Malic, Citric, Succinic, Lactic, Acetic -- e.g. total G/L of Acids.) Tartaric and Malic acids are the predominant organic acids in wine, their sum is a fair estimate of Total Acidity.

Titrateable acidity, titration of wine acids with a strong base, is

the standard way to assess a wine's buffering capacity. Buffering depends on  $K^+$ ,  $Na^+$ ,  $H^+$  (i.e. pH) and their varying affinities to weak acids present. The combination of these weak organic acids and alkaline metals, predominantly Tartaric Acid / Potassium Bitartrate and L-Malic Acid and salts, is responsible for pH buffer capacity - this is determined by measuring Titratable Acid.

Total Acidity of a wine (estimated by L-Malic + Tartaric) is GREATER than the corresponding Titratable Acidity.

Tartaric Acid measurement is useful for assessing total wine acidity as well as estimating Tartrate Stability of a wine.

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