

## Tartaric Acid: Wine Acidity.

Tartaric acid and tartrate are playing an important role in the stability of wines. They can be present in wine and juice in various forms, like tartaric acid (H<sub>2</sub>T), potassium bi-tartrate (KHT) or calcium tartrate (CaT). The ratio of these depends mainly on the pH of the wine. The percent of tartrate present as bitartrate (HT<sup>-</sup>) is maximum at pH 3.7.

The formation of crystalline deposits (tartrate casse) is a phenomenon of wine aging but does not meet customer acceptance. It is therefore important to test for, and to reduce potential of bottle precipitation; for example by adjusting the pH of the wine that significantly influences the potential of casse formation.

Potassium concentrations in wine can range from 600 to 2500 ppm in certain red wines. Although the potassium bi-tartrate is soluble in water, alcohol and low temperatures decrease its solubility. Especially during the alcoholic fermentation potassium bi-tartrate becomes increasingly insoluble resulting in super-saturation and precipitation. The KHT stability can be restored by chilling (with or without seeding). Wines with initial pH values below 3.65 can show a reduction in pH during cold stabilization because of generation of one free proton for each KHT precipitated. The pH may drop as much as 0.2 pH units. For wines at higher pH than 3.7, the pH shifts to a higher pH.

Calcium concentrations can range from 6 to 165 ppm and may complex with tartrate or oxalate to form crystalline precipitates. Calcium tartrate instabilities occur normally from 4 to 7 months after fermentation and are temperature independent.

Sulphates, proteins, gum and poly-phenols can form stable complexes with tartrate thus inhibiting case formation. the complexes are mainly between poly-phenols and tartaric acid in red, and proteins in white wine. This explains why, as pigment polymerization occurs, the holding capacity of tartaric acid diminishes, resulting in delayed casse. the sulfate instead does not complex with potassium from 50% in white wines up to 100% in red ones.

Tartaric acid concentrations in wine range normally from 1.5 to 4.0 g/L. This acid concentration may not be confused with total or titratable acidity of wines that are often expressed in tartaric acid content too. Although it is the tartaric acid that is the predominantly present acid (up to 60% of the total acidity), others like malic, citric and several volatile acids do give a significant contribution total acidity.

HANNA's HI 83748 is an invaluable instrument to monitoring this crucial parameter in the process of wine making.



*"HANNA wine photometers are very small. It is very important in a laboratory like this because space is always limited."*

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#### SPECIFICATIONS

#### HI 83748 Tartaric Acid Photometer

Range	0.0 to 5.0 g/L
Resolution	0.1 g/L
Precision	SD ±0.1 g/L @ 2.0 g/L
Light Source	Tungsten lamp with narrow band interference filter @ 525 nm
Sensor	Silicon photocell
Method	The reaction between Tartaric Acid and the reagents causes a yellow/orange red tint in the sample.
Environment	0 to 50°C; max 95% RH non-condensing
Battery Type	(4) 1.5V AA batteries/12 VDC adapter
Auto Shut-off	After 15 minutes of non-use
Dimensions	225 x 85 x 80 mm (8.7 x 3.3 x 3.1")
Weight	500 g (17.6 oz)

#### ORDERING INFORMATION

**HI 83748-01** (115V) and **HI 83748-02** (230V) is supplied with sample cuvetts and caps (2), reagents for 5 tests (HI 83748A-O, HI 83748B-O), 200 µL automatic pipette with Instruction Sheet, plastic tips for 200 µL automatic pipette (2), 5 mL syringe with tip, 12 VDC adapter, 1.5V AA batteries (4), cuvet cleaning cloth and instruction manual in a rugged carrying case

#### REAGENT SETS

**HI 83748-20** Tartaric Acid reagents set for wine (20 tests)

#### OTHER ACCESSORIES

- HI 740027P** 1.5V AA batteries (10)
- HI 731318** Cuvet cleaning cloth (4)
- HI 731321** Glass cuvetts (4)
- HI 731325W** Caps for cuvetts (4)
- HI 93703-50** Cuvet cleaning solution (250 mL)
- HI 740226** 5 mL graduated syringe
- HI 731340** 200 µL automatic pipette
- HI 731350** Plastic tips for 200 µL automatic pipette (25)