

Titrateable Acidity of Wines

Titrateable Acidity (not the same as total acidity) measures the quantity of acid in musts and wines. TA measures all of the combined fixed acids in the wine, (mainly tartaric, malic and citric) and tells you how acidic/tart the wine is. TA is expressed in either %TA or in g/L of Tartaric Acid. For example, a wine's TA could be expressed as 0.65% TA or as 6.5g/L TA. Generally, a wine with a high titrateable acidity (TA) will have a low pH. But there is no direct relationship between pH and TA, so each should be measured.

TA affects the quality of a wine. If a wine is too low in acid, it tastes flat and dull. If a wine is too high in acid, it tastes too tart and sour. The TA also affects mouth feel of the wine, and helps with its chemical stability and aging ability.

Measurement of TA

A combination pH/TA meter is the simplest, fastest and most expensive method of measurement. Follow the manufacturer's instructions for calibration and use.

The traditional, inexpensive but slower method of measuring TA is by titration using an alkaline solution to neutralize the acids in the juice or wine. The titration kits sold for less than \$10 are not accurate and should not be trusted. Instead, use lab equipment to do a much more reliable titration:

- measure 5ml of juice or wine sample using a pipette, & add it to
- 20ml of distilled water with
- 3 or 4 drops of phenolphthalein
- titrate with a burette to the end point with 0.1N NaOH. End point must hold for 30 seconds or reach a pH of 8.2
- ml of NaOH needed to neutralize $\times 0.15 = \%TA$

If you get a surprising result, check the calculation and/or re-run the test before making any adjustment.

Recommended Ranges of TA

White wines generally have a higher TA than red wines. Within each color category, a sweet wine generally needs more acid than a dry wine to provide balance in the wine's taste.

White wines usually have a TA between 0.6 and 0.9%.

Red wines usually have a pH between 0.5 and 0.7%.

Fruit wines are usually within this range, but since they are generally sweet, they tend to the upper end of the range to provide balance.

Adjusting TA

Several methods can be used to adjust TA. Calcium carbonate (CaCO_3) or Potassium bicarbonate (KHCO_3) will neutralize some of the acid in the juice or wine. There is a direct relationship between the amount of additive and the change in TA. After making any TA adjustment, the pH should be checked.

$\frac{1}{2}$ tsp (1.12 grams) of CaCO_3 per gallon lowers TA by about 0.1%

1- $\frac{1}{3}$ tsp (4.7 grams) of KHCO_3 per gallon lowers TA by about 0.1%

$\frac{3}{4}$ tsp (3.5 grams) Acid blend will increase TA about 0.1%

$\frac{3}{4}$ tsp (3.8 grams) Tartaric Acid will increase TA about 0.1%

It is safest to make chemical adjustments on a small volume (bench trial), checking both TA and pH, then verify the results by tasting before scaling up to the full volume of wine being adjusted.

TA generally decreases with fermentation, especially with Lalvin 71B yeast which can remove 25% of malic acid.

Malolactic fermentation will lower the TA of a wine by converting malic acid to lactic acid.

Cold stabilization will lower TA by precipitating Potassium bitartrate.

TA can also be adjusted by amelioration (adding water), or by blending with another wine.