

# Sulfur Dioxide Mini Titrator

For the Determination of Sulfur Dioxide for Wine Analysis



- Titrator, magnetic stirrer, electrode & reagent holder in one compact unit
- Results in minutes • Simple to operate

## SPECIFICATIONS

### HI 84100 mini Titrator

Range	0 to 400 ppm of SO <sub>2</sub>
Resolution	1 ppm
Accuracy	5% of reading
Method	Ripper titrimetric method
Principle	Equivalence point redox titration
Sample Volume	50 mL
ORP Electrode	HI 3148B/50 (included)
Pump Dosing	0.5 mL/min
Stirring Speed	1500 rpm
Environment	0 to 50°C (32 to 122°F); max 95% RH non-condensing
Power Supply	115V/230 Vac; 50-60Hz; 10VA
Dimensions	208 x 214 x 163 mm (8.2 x 8.4 x 6.4") (with beaker)
Weight	2200 g (77.6 oz.)

## ORDERING INFORMATION

**HI 84100-01** (115V) and **HI 84100-02** (230V) is supplied with reagent set for 20 titrations, 50 mL beakers (2), 20 mL beakers (2), scissors, tube set with cap, ORP electrode, stir bar, power cable, 30 mL bottle of electrode refill solution, 1 mL syringe, wine deposits cleaning solution sachets (2), wine stain cleaning solution sachets (2) and instructions.

## PROBES

**HI 3148B/50** ORP Probe with shorter cable

## SOLUTIONS

- HI 70300L** Electrode storage solution, (500 mL)
- HI 70635** Cleaning solution for wine deposits (500 mL)
- HI 70636** Cleaning solution for wine stains (500 mL)
- HI 7082** Electrode filling solution, 30 mL (4)

## REAGENTS

- HI 84100-50** Titrant solution (110 mL)
- HI 84100-51** Alkaline reagent (500 mL)
- HI 84100-52** Acid reagent for total SO<sub>2</sub> determination (500 mL)
- HI 84100-53** Acid reagent for free SO<sub>2</sub> determination (500 mL)
- HI 84100-54** Stabilizer reagent (25)
- HI 84100-55** Calibration standard (500 mL)

## ACCESSORIES

- HI 70483T** Tube set with cap for titrant bottle and tip
- HI 731316** Stir bar (5)
- HI 740036P** Beaker 50 mL (10)
- HI 740037P** Beaker 20 mL (10)

## Free and Total Sulfur Dioxide

An important reason for adding SO<sub>2</sub> is to avoid oxidation. When there is oxygen around, SO<sub>2</sub> itself becomes oxidized before phenol compounds in the wine, and so acts as an oxygen scavenger. Also, SO<sub>2</sub> suppresses the activity of enzymes that cause browning and other problems.

What is really protecting your wine is molecular SO<sub>2</sub>. When you add SO<sub>2</sub>, depending of circumstances, some of it immediately becomes bound. The relationship between the amount of SO<sub>2</sub> and amount of SO<sub>2</sub> remaining free is complex. It is clear, however, that is largely governed by the total SO<sub>2</sub> content of the wine. The rate of binding decreases as the free SO<sub>2</sub> concentration increases. The exact relationship between free and bound (total-free) SO<sub>2</sub> will vary from wine to wine.

Below 30-60 ppm, 33% to 50% of SO<sub>2</sub> addition becomes bounded. What remains is called "free" and it is divided in two parts. The larger, and relatively ineffective free part is "bisulphite" (HSO<sub>3</sub><sup>-</sup>). The smaller part of the free is the active molecular. The amount of molecular SO<sub>2</sub> in your wine depends both on the level of free SO<sub>2</sub> present as well as pH. For instance, at pH 3.2, the amount of the free SO<sub>2</sub> for 0.8 ppm molecular SO<sub>2</sub> is 22 ppm. At pH 3.5, you will need 43 ppm free - essentially double.

In most situations, 0.8 pp, molecular SO<sub>2</sub> during bulk storage and at bottling will provide you with adequate protection from oxidation and bacterial action. This includes prevention of malolactic bacteria as well.

It is important to remember that the amount of free SO<sub>2</sub> in the wine depends on three things: how much is added, how much was present before the addition and how much of your addition promptly becomes bound.

The level at which molecular SO<sub>2</sub> can be detected by the human senses is about 2.0 ppm. This is also the level which is needed for maximum protection of your wine. This is particularly true in the case of sweet, and most notably, botrytised wines.

The HANNA HI 84100 offers the possibility to test free or total SO<sub>2</sub> in all the wines including the red ones, that are difficult to test with manual methods because the color changes are hardly seen.