



HI 84100 mini Titrator

FOR THE DETERMINATION OF FREE AND TOTAL
SULFUR DIOXIDE FOR WINE ANALYSIS



Why Sulfur Dioxide is important...

An important reason for adding SO₂ is to avoid oxidation. When there is oxygen around, SO₂ itself becomes oxidized before phenol compounds in the wine, and thus acts as an oxygen scavenger. Also, SO₂ suppresses the activity of enzymes that cause browning and other problems.

What is really protecting your wine is molecular SO₂. When you add SO₂, depending on circumstances, some of it immediately becomes bound. The relationship between the amount of added SO₂ and the amount of SO₂ remaining free is complex. It is clear however, that it is largely governed by the total SO₂ content of the wine. The rate of binding decreases as the free SO₂ concentration increases. The exact relationship between free and bound (total-free) SO₂ will vary from wine to wine.

Below 30-60 ppm, 33% to 50% of SO₂ addition becomes bound. What remains is called "free" and is divided in two parts. The larger and relatively ineffective free part is "bisulphite" (HSO₃⁻). The smaller part of the free is the active molecular SO₂. The amount of molecular SO₂ in your wine depends both on the level of free SO₂ present as well as pH. For instance, at pH 3.2 the amount of free SO₂ for 0.8 ppm molecular SO₂ is 22 ppm. At 3.5, you will need 43 ppm free, essentially double.

Free concentration (ppm) for 0.8 ppm molecular SO₂:

pH	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9
Free SO ₂	14	18	22	28	35	44	55	69	87	109

In most situations, 0.8 ppm molecular SO₂ 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 SO₂ in the wine depends on 3 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 SO₂ can be detected by human senses is about 2.0 ppm. This also is 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 quickly and accurately test free or total SO₂ in all wines (including red).

HI 84100

mini Titrator

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

Free and Total Sulfur Dioxide

The HI 84100 is a low cost, easy to use, microprocessor-based automatic titrator that benefits from HANNA's years of experience as a manufacturer of analytical instruments.

The HI 84100 has a simple and reliable peristaltic pump to ensure accurate dosing and repeatability. By performing pump calibration with the provided HANNA standards, instrument accuracy is assured.

This instrument is supplied with a pre-programmed analysis method designed for free and total sulfur dioxide measurements on wine samples. The instrument features a powerful and effective built-in algorithm to analyze the shape of the electrode response curve and to determine the reaction completion. This algorithm automizes the analysis and makes all necessary calculations. The HI 84100's interface is clean and simple.

By simply pressing the START/STOP button, the instrument will automatically make the titration up to the equivalence point. The result is immediately displayed in convenient units, then the instrument is ready for another titration.

Affordable for
all sized wineries



1. Peristaltic Pump and Tube Set
2. ORP Electrode
3. Electrode Holder
4. Mini Stirrer
5. Touch Keypad
6. 50 & 20 mL Beakers
7. Refill Solution
8. Scissors
9. 1 mL Syringe
10. Wine Deposit Solution Sachets
11. Wine Stain Solution Sachets
12. Plastic Dropper
13. Stabilizer



- **Stability Indicator**
- **Calibration Messages**
- **Secondary Display**

Pre-programmed
Free & Total
Sulfur Dioxide
analysis method for
wine samples!



- 14.** Acid Reagent
- 15.** Standard Solution
- 16.** Titrant Solution

- 17.** Alkaline Solution
- 18.** Large LCD Display
- 19.** Titrant Holder

Also Available from **HANNA**

TITRATABLE TOTAL ACIDITY mini Titrator

HI 84102 for the Determination of Titratable Total Acidity in Wine

TARTARIC ACID Photometer

HI 83748 for the Determination of Tartaric Acid in Wine

TOTAL PHENOLS & COLOR Photometer

HI 83742 for the Determination of Total Phenols & Color in Wine

COPPER Photometer

HI 83740 for the Determination of Copper in Wine

IRON Photometer

HI 83741 for the Determination of Iron in Wine

pH & TEMPERATURE Bench & Portable Meters

HI 222 & HI 9026W pH & Temperature in Wine



Contact your local **HANNA** instruments® distributor for more information
or visit us on the web: www.hannainst.com

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Ordering Information

HI 84100 is supplied complete with reagent set for 20 titrations, (2) 50 mL beakers, (2) 20 mL beakers, scissors, tube set with cap, ORP electrode, stir bar, power cable, 30 mL bottle of refill solution, 1 mL syringe, (2) wine deposits cleaning solution sachets, (2) wine stain cleaning solution sachets and instruction manual.



Specifications	HI 84100 mini Titrator
Range	0 to 400 ppm of SO ₂
Resolution	1 ppm
Accuracy	5% of reading
Method	Ripper titrimetric method
Principle	Equivalence point redox titration
Sample Volume	50 mL
ORP electrode	HI 3148B (included)
Pump Volume	0.5 mL/min
Stirring Speed	1500 rpm
Environment	0 to 50°C (32 to 122°F); max 95% RH non-condensing
Power Supply	110V/60 Hz; 10VA
Dimensions	208 x 214 x 163 mm (8.2 x 8.4 x 6.4") (with beaker)
Weight	2200 g (77.6 oz.)

Accessories

HI 70300L	Electrode storage solution (500 mL)	HI 84100-54	Stabilizer reagent (25 pcs.)
HI 70635	Cleaning solution for wine deposits (500 mL)	HI 84100-55	Calibration standard (500 mL)
HI 70636	Cleaning solution for wine stains (500 mL)	HI 3148B	ORP probe with shorter cable
HI 7082	Electrode filling solution (4 x 30 mL)	HI 70483T	Tube set with cap for titrant bottle and tip
HI 84100-50	Titration solution (110 mL)	HI 731316	Stir bar (5 pcs)
HI 84100-51	Alkaline reagent (500 mL)	HI 740036P	Beaker 50 mL (10 pcs.)
HI 84100-52	Acid reagent for total SO ₂ determination (500 mL)	HI 740037P	Beaker 20 mL (10 pcs.)
HI 84100-53	Acid reagent for free SO ₂ determination (500 mL)	HI 740198	Power cable

2 year
LIMITED WARRANTY

Authorized Distributor



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instruments
With Great Products, Come Great Results™
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