

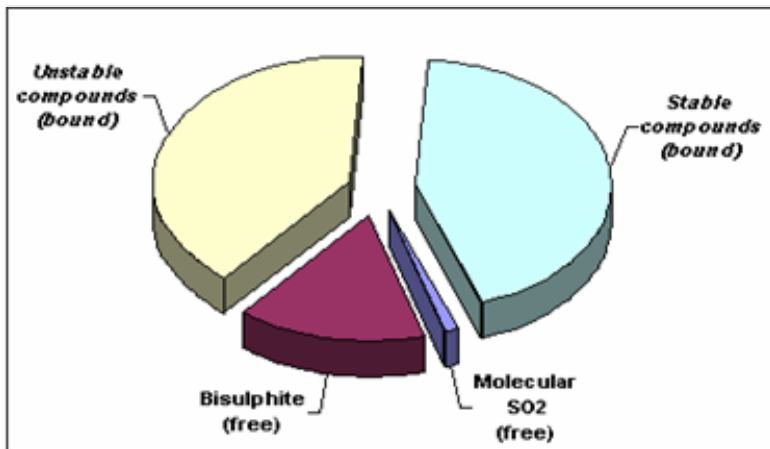
## Winemaking and the importance of pH testing

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The pH of wine is important to determine because it will affect the quality of the product in terms of taste, color, oxidation, chemical stability and other factors. The general rule of pH in winemaking is the higher the pH reading, the lower amount of acidity in the wine. Three important factors in determining the pH of wine include the ratio of malic acid to tartaric acid, the amount of potassium and the total amount of acid present.

Most wines optimally have a pH between 2.9 and 4.0, with different values based on the type of wine. Any pH above 4.0 indicates that the wine will spoil quickly and be chemically unstable. Lower pH values allow the wine to stay fresher for a longer period and retain its original color and flavor. High pH wine is more likely to breed bacteria and become unsuitable to drink. For white wines, the ideal final pH is between 3.00 – 3.30 while the final pH for red wine is ideally 3.40-3.50. The optimal pH before the fermentation process is between 2.9-- 4.0. The pH of wine therefore not only affects the color of wine, but also the oxidation, yeast fermentation, protein stability, bacteria growth and bacterial fermentation.

The pH can impact the amount of free sulfur dioxide (SO<sub>2</sub>) present, which breaks down bacteria and prevents spoiling. In finished wine a pH of 3.5-4.0 about 25-150 mg/l free SO<sub>2</sub> is necessary for 0.825 mg/l molecular. To determine the amount of free SO<sub>2</sub> by pH, multiply the value of the fraction of the pH for an estimate. See the tables below (source: Hanna Instruments pH Overview for Winemakers)



| Free SO <sub>2</sub> needed for 0.8 ppm molecular SO <sub>2</sub> |                      |
|---|----------------------|
| pH  | Free SO <sub>2</sub> |
| 3.0   | 14                   |
| 3.1   | 18                   |
| 3.2   | 22                   |
| 3.3   | 28                   |
| 3.4   | 35                   |
| 3.5   | 44                   |
| 3.6   | 55                   |
| 3.7   | 69                   |
| 3.8   | 87                   |
| 3.9   | 109                  |

## The HI 2222 pH meter for analytical wine testing



The HI 2222 is the only pH meter on the market today that allows for automatic pH calibration at pH 3 and pH 7. With pH 3.00 buffer, any error due to calibration will be minimized. The HI 2222, formerly the HI 222 The new model features an extra wide LCD with bigger digits than the previous model, easier to read at a better sight angle. It also includes a new temperature probe, extended temperature range and increased temperature accuracy. An opto-isolated USB port is featured at the back of the unit.

The main feature of the HI 2222 is HANNA®' signature Calibration Check™ technology that detects when the electrode is dirty and gives warning during calibration. Dirty electrodes can skew a pH reading by as much as 0.5 pH, so it is of the utmost importance to properly clean the pH electrode prior to use.

To order your HI 2222 Professional pH Meter for Wine Analysis call 1.800.426.6287 or visit <http://www.hannainst.com/usa> .