



Potassium in Wine Must

Description

Potassium is one of the most common ions found in plants cells, comprising up to 10% of the total dry matter in the plant. Potassium plays an important role in a variety of plant processes including maintaining turgor pressure, activating enzymes, and mediating plant growth. In wine grapes, potassium also plays an important role in determining the pH of the juice and the stability of the finished wine.

As the potassium content in grapes increases, tartaric acid binds with potassium ions, forming potassium tartrate. Once saturated, potassium tartrate will precipitate, removing free acidity from the juice. This results in a juice with decreased acidity and increased pH. Potassium uptake from the soil by the grapevine roots is accelerated in warm, dry climates. This causes the resulting grapes to typically have pH values above the ideal range of pH 3.0 to 3.8. Wines made from grapes outside of this ideal pH range are prone to problems with protein stability, flavor, and microbial stability. Additionally, finished wines that are oversaturated with potassium tartrate may be prone to problems with tartrate stability.

Wines and juice with pH values above pH 3.8 due to high potassium content may be adjusted by addition of tartaric or malic acid. These adjustments will both lower the pH and raise the acidity, and are typically made in the juice before fermentation. However, chemical adjustment

is an expensive process so many winemakers have turned to addressing the cause of the high pH. Potassium can naturally be lowered in grapes by limiting the availability of potassium to the vines. This includes rootstock selection, reducing soil potassium, and other vineyard practices. Avoidance of additives to the must or finished wine is also mandatory for winemakers attempting to make organic wines. An alternate practice employed by such winemakers is to monitor potassium in their grapes and must, and to utilize a blend of wine grapes to ensure an ideal balance of potassium, pH, and acidity.

Application

An organic winemaker contacted Hanna for a method for determining potassium content in a large quantity of grape juice and must samples before fermentation. It was important that the test can be conducted quickly and in colored solutions. Hanna offered the **HI5222** Research Grade pH/ISE/ORP Meter with the **HI4114** Combination Potassium Ion Selective Electrode (ISE). The HI4114 uses an organic polymer membrane sensitive to potassium ions. The customer was at ease knowing that the potassium ISE is a well-documented technology for measuring potassium content in both red and white juice, must, and finished wine. Once calibrated and set up, the HI4114 and HI5222 can take a large quantity of measurements accurately and quickly. The customer appreciated the large log space of 100,000 data points, which allowed lot logging

with notes to track multiple samples. The meter was supplied with the **HI1131B** Combination pH Electrode. The inclusion of a pH electrode provided value since the winery could also use the meter for their pH measurements and manual acidity titrations. Overall the customer found the meter a great match for their goal to produce high quality, organic wines.

