

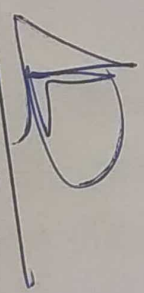
DEPARTMENT OF CHEMISTRY

Onsite Programme 2017-2018

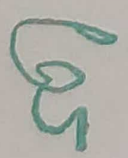
SL. NO	TITLE OF THE LINKAGE	NAME OF THE PARTNERING INSTITUTION/INDUSTRY/RESEARCH LAB WITH CONSTANT DETAILS	YEAR OF COMMENCEMENT	DURATION (FROM-TO)	NATURE OF LINKAGE	LINK OF RELEVANT DOCUMENT
1	Onsite Program	Wine park "Anandrathi"	2017	10/8/2017 to 16/8/2018	Wine analysis training	Attached



**Head**  
 Dept. of Chemistry  
 SB Arts & KCP Sc. College  
 Vijayapur.



**IQAC, Co-ordinator**  
 S.B.Arts & K.C.P.Science College,  
 Vijayapur.



**Principal,**  
 S.B. Arts and KCP Science College  
 VIJAYAPUR

B.L.D.E. Association's

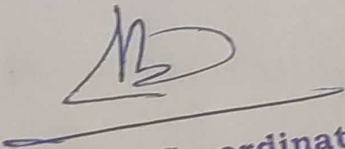
*S.B. Arts and K.C.P. Science College, Vijayapur-586103*


**Department of Chemistry**

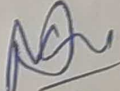
**NOTICE**

**Date :04/08/2017**

It is here by informed to the chemistry students that, there is Industrial visit at Anandrathi, Wine factory Vijayapur for 7 days. So interested students can enroll their names to the Dr. M S Yadawe before 04/08/2017.

  
**IQAC, Co-ordinator**  
S.B.Arts & K.C.P.Science College,  
Vijayapur.

  
**Principal,**  
S. B. Arts & KCP Sc. College,  
Bijapur

  
**Head**  
Dept. of Chemistry  
SB Arts & KCP Sc. College,  
Vijayapur.

2017-18

# PROJECT REPORT ON

Wine Analysis Training



RICOWINERY, VINEYARDS AND WINE PARK, VIJAYAPUR

## ANANDRATHI

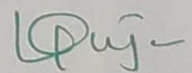
ANANDRATHI SHARE & STOCK BROKER LTD, VIJAYAPUR

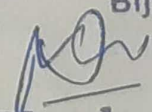
Industrial Training on 10<sup>th</sup> to 16<sup>th</sup> August 2017

Sites Visited:

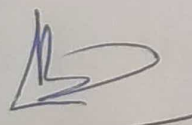
Number of Students: 10

Faculty coordinators: 01

  
Principal,  
S. B. Arts & KCP Sc. Colleg-  
Bijapur

  
Head  
Dept. of Chemistry  
SB Arts & KCP Sc. College,  
Vijayapur.

Dr.M.S.Yadawe

  
IQAC, Co-ordinator  
S.B.Arts & K.C.P.Science College,  
Vijayapur.

# Industrial Training

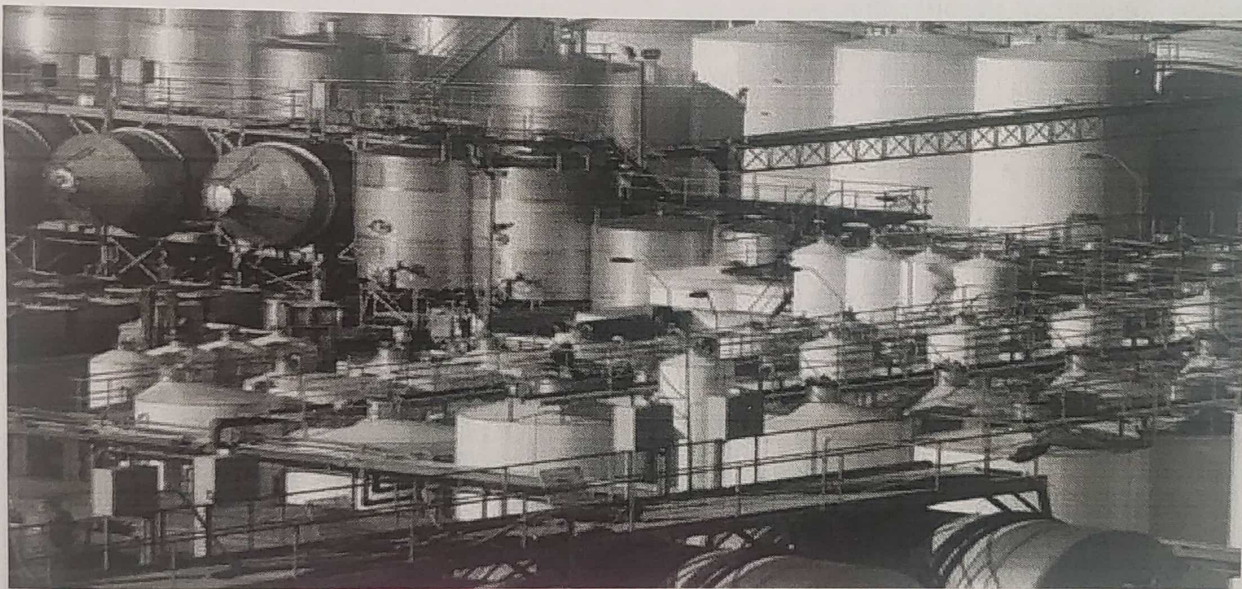
## Aim of this Training

### Testing Wine

Throughout the entire winemaking process it's important to test our wines to make sure they are healthy and are progressing as we would like. More Wine! highly recommends testing wine for the following:

### Wine should ONLY be wine

People trust their wine to be exactly as they expect: unadulterated, safe, and consistent. Our customers know how long it takes to build a brand's reputation and how quickly one can disappear. So they come to us and our widest instrumentation portfolio - ion, liquid and gas chromatography, metal analysis, mass spectrometry, discrete analyzers and data management - for accurate, reliable answers for their wine testing needs.



wine making process

## pH Testing

The pH is a measure of how strong the acids are in relation to all of the other compounds in a wine or must. The lower the value, the more strongly acidic the sample will be; i.e. a pH of 3.3 will be more acidic than 3.9. In winemaking, most pH values will be between the 3.0 and 4.0 ranges, with most of the focus happening in the range of tenths between these two ends

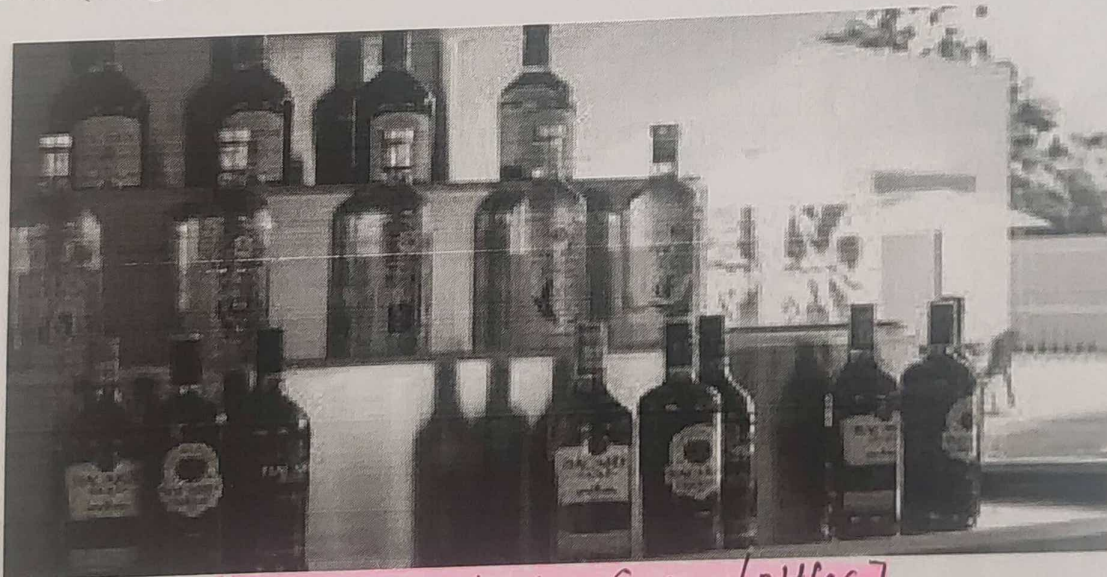
("3. pH"). While the TA will tell you how much physical acid there is in the wine or must, the pH tell you how this acidity will be perceived.

### How To Test pH:

You test the pH using a specialized tool called a pH meter. The pH meter should be calibrated using a set of pH buffer solutions. Once calibrated, all that is needed to test the pH of wine or must is to insert the probe into the sample and slowly stir until the reading on the meter stabilizes. That's it!

### Some Useful Info About pH:

- Unlike TA testing and adjusting, pH adjustments are not linear; if you add 1 g/L of acid to a wine or must you now have exactly 1 more g/L of acid in solution and a TA test will confirm this. However, if you add 1 g/L of Potassium Carbonate to a wine or must the reaction will vary from wine to wine and the pH will not shift in a linear, predictable fashion. This is why any attempt to adjust the pH should start with a bench trial!
- pH units are logarithmic; a pH of 3.0 is ten times more acidic than a pH of 4.0. So beware, a little shift goes a long way.
- The effectiveness and amount of free SO<sub>2</sub> needed to protect our wines is directly tied to wine pH: lower pHs require less free SO<sub>2</sub>, and higher pHs require more free SO<sub>2</sub> to achieve the same amount of protection. **Note:** at pH 3.8 and higher, it is not chemically possible to maintain the amount of free SO<sub>2</sub> in the wine that is technically required to protect it. So, if your wine has a high pH, then we highly recommend adjusting the pH down (using tartaric acid).



Final products (wine bottles)

## SO<sub>2</sub> Testing

SO<sub>2</sub> testing is an integral part of winemaking and SO<sub>2</sub> management begins as soon as you add sulfite to the wine. Having the right amount of SO<sub>2</sub> in your wine prevents enzymatic browning and guards against premature oxidation. SO<sub>2</sub> preserves freshness

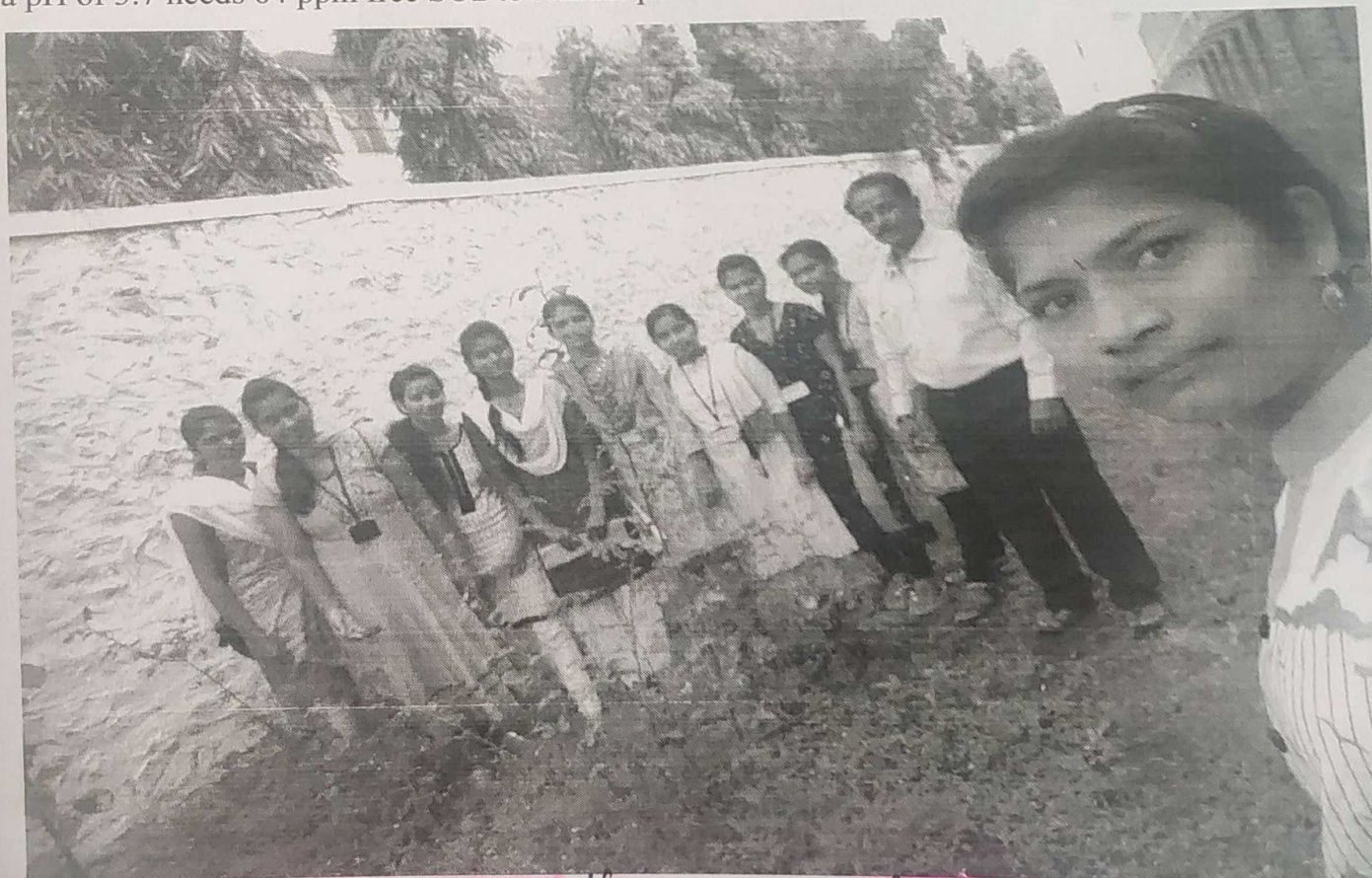
and color and it helps stabilize a wine against microbial spoilage. If a wine does not contain the required amount of  $\text{SO}_2$ , chances are it won't gracefully make it past one year in the bottle (depending on the wine pH).

### **Bound & Free $\text{SO}_2$ :**

There are two forms of  $\text{SO}_2$  that we need to be aware of: Bound  $\text{SO}_2$  and Free  $\text{SO}_2$ . When you make an  $\text{SO}_2$  addition, a portion of it binds with elements in the must or wine (acetaldehyde, yeast, bacteria, sugars, tannin, oxygen, etc.) and is referred to as bound. The rest of the addition remains unbound and is referred to as free. It is this latter portion we are interested in because only this free  $\text{SO}_2$  brings you the previously mentioned benefits/protection.

### **How Much $\text{SO}_2$ Should I Use?:**

The actual amount of  $\text{SO}_2$  needed is quite small, and is referred to as "ppm" (parts per million). The goal with  $\text{SO}_2$  testing and management is to use the least amount needed in order to maintain a beneficial saturation level (0.8 ppm molecular of  $\text{SO}_2$ ), while trying to avoid adding too much, which would flaw the wine by giving it a sulfite smell and/or taste. Interestingly, the amount of  $\text{SO}_2$  needed to protect a wine is dependent on its pH; at a higher wine pH the required ppm of  $\text{SO}_2$  is higher than it is at a lower wine pH. For example, a wine with a pH of 3.3 requires 27 ppm free  $\text{SO}_2$ , while a wine with a pH of 3.7 needs 64 ppm free  $\text{SO}_2$  to remain protected.



A visit to the wine factory

# Sugar Testing

Winemakers measure sugar concentration in "degrees Brix", or just "Brix" (1.0 Brix = 1 g sugar in 100mL water). Being able to test the sugar content of the must or wine at the following stages of winemaking gives us important data that we can use to control our alcohol levels and manage our fermentations:

## Harvest/Crush:

It is a good idea to test the sugar level at the beginning of fermentation because the amount of sugar in the juice determines the amount of alcohol that will end up in the final wine: for every 1.0 Brix consumed, 0.62% alcohol is created. Sugar testing can be done with a refractometer or a hydrometer. We suggest a starting Brix range of 22-25 Brix for Red wines, and 17-24 Brix for White and Rose wines. If your must is over or under these ranges we recommend correcting it before fermentation starts. Complete information on correcting sugar levels in must can be found in both our Red Winemaking Manual and our White Winemaking Manual.

## End of fermentation:

Unless you are trying to make a dessert wine, most wines are fermented to "dryness", meaning there is less than 2 g/L (0.2%) of residual sugar in the wine. A specialized " $\pm 5/-5$ " Brix hydrometer is a good way to tell if you are generally done fermenting the last of your sugars (look for a reading of -1.5 to -2.5 Brix) but it will not give you the most accurate result. If you want the most accurate test for residual sugars in your wine, you will need to run a Clinitest residual sugar test.



A visiting to the sugar testing factory

# Total Acidity Testing

When we test a wine or must for its Total Acidity we are determining the actual amount of physical acid there is in our sample wine or must. This Total Acidity number is important because along with a wine's pH, the TA tells us:

- If the wine will likely be in balance with itself
- How much the pH can be adjusted (if needed)
- How well the wine will age over time

(A complete explanation of wine acidity and pH (along with in-depth instructions for adjusting them if needed) can be found in both our Red Winemaking Manual and our White Winemaking manual.)

## How TA testing works:

Whether using our basic MoreWine! Acid test kit or our Automatic Total Acidity Titrator from Hannah, the principles behind TA testing remain the same: Sodium Hydroxide (a base) is used to neutralize the acidity of a fixed amount of wine or must sample, one drop at a time. When a pH of 8.2 is reached all of the acid will have been neutralized and, based on how many drops of Sodium Hydroxide we used, we can then calculate the amount of acid that was in the sample.

# Malolactic Chromatography Testing

Malolactic fermentation (MLF) is a winemaking process involving a special bacterial strain that metabolizes the malic acid naturally found in grapes into lactic acid. Lactic acid is a weaker acid than malic acid so the effect of this conversion is a decrease in the wine's acidity along with a corresponding raise in the wine's pH. As an additional benefit, the bacteria also add mouthfeel and complexity to the wine. (Complete information on MLFs can be found in our Malolactic Fermentation Manual).

## Malolactic Fermentation For All Wines?:

Completing a malolactic fermentation adds to the stability of a wine: once the malic acid is gone it is no longer available for any potential spoilage bacteria capable of metabolizing it to make undesirable flavors and aromas in our wine. However, it should be noted that as convenient as this stability is, malolactic fermentation does influence the fruit profile of a wine:

- For red wines this impact is most always beneficial, and we recommend an MLF for all red wines.
- For white wines, doing a malolactic fermentation may not always be desired: If you are looking for an opulent, fuller/fatter styled wine like many Californian Chardonnays and some styles of Sauvignon Blanc, then a complete MLF is recommended. However, if you are after a lighter, crisper styled white wine, then you probably do not want to change the fruit profile in any way. In this case, an MLF is not recommended.
- The winemaker also has the choice of doing a partial MLF; where an MLF is started for some complexity then stopped with SO<sub>2</sub> before completion to maintain more of the original fruit profile.

## Malolactic Chromatography Testing:

To monitor the progress and/or completion of a malolactic fermentation, we use a malolactic chromatography test kit. Using the kit is pretty straightforward: sample wine is spotted onto a special piece of paper which is rolled into a cylinder and placed standing into a small amount of a developing solution. Over the next 8 hours the solution wicks up the paper and carries the acids in the wine sample up with it. Once finished, the paper is removed from the solution and allowed to dry. As it dries, the paper turns blue/green and the acid spots show yellow. You read



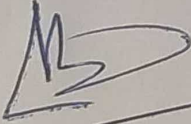
the chromatography test by the presence and size of the malic acid spot as it relates to the lactic spot. That's it! (Complete instructions for prepping and reading a chromatography test can be found in MoreWine!'s Chromatography Test Kit Instructions.)

## Wine making Thermometers

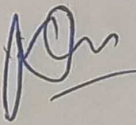
Temperature plays an important role in winemaking and there are several instances where a winemaking thermometer is an indispensable tool:

- Yeast hydration is optimal at 104 F, and a 12" lab thermometer is a great, low cost tool for making sure you can accurately hit the targeted temperature and get your fermentation off to a great start.
- Monitoring wine fermentation temperatures is important so you can avoid heat spikes or cold snaps which could adversely affect your yeast. A floating thermometer is really convenient because it can be placed and left in the must without fear of it sinking to the bottom of the fermenter!
- Storage vessels can easily be outfitted with a winemaking thermometer to monitor their temperatures. These thermometers come in two forms: a Bi-Metal dial thermometer with a 6" probe or a thermometer with a 2" probe that screws into a 1/2" threaded female coupler on the tank, or as an LCD strip called a Fermometer that adheres to the side of the tank or bucket .
- Cellar areas should ideally be maintained at around 55 F with 65-75% humidity. MoreWine!'s combination clock, thermometer and hygrometer will help you dial this in!

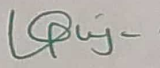
END



**IQAC, Co-ordinator**  
S.B.Arts & K.C.P.Science College,  
Vijayapur.



**Head**  
Dept. of Chemistry  
SB Arts & KCP Sc. College,  
Vijayapur.



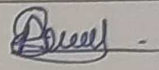
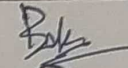
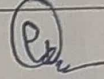
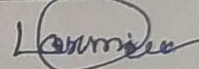

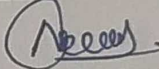
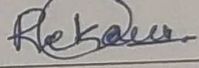
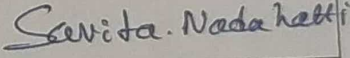

**Principal,**  
S. B. Arts & KCP Sc. College,  
Bijapur

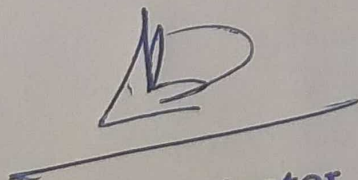
B.L.D.E. Association's

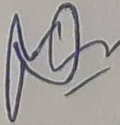
S.B. Arts and K.C.P. Science College, Vijayapur-586103

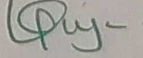
## Department of Chemistry

### Student List

Sl No	Name of students	Sign
1)	Akshata Hiremath	
2)	Bhuvaneswari kambar	
3)	Geeta Desai	
4)	Laxmi Kolakur	
5)	Pavitra Topi	
6)	Neha Umarani	
7)	Rekha Mali	
8)	Savita Nadahatti	
9)	Shreedevi Babaleswar	

  
**IQAC, Co-ordinator**  
S.B.Arts & K.C.P.Science College,  
Vijayapur.

  
**Head**  
Dept. of Chemistry  
SB Arts & KCP Sc. College,  
Vijayapur.

  
**Principal,**  
S. B. Arts & KCP Sc. Coll.,  
Bijapur



**B.L.D.E. ASSOCIATION'S  
S. B. ARTS AND K. C. P. SCIENCE COLLEGE  
BIJAPUR**



RE – ACCREDITED AT THE 'B' LEVEL  
Phone: (08352) – 261766, (08352) 262770 Extn. 2223, 2224  
Fax: 08352 – 261766 E-mail: bldesbkcp@gmail.com

REF./ PÅæªÀiÁAPÀ : \_\_\_\_\_

Date: \_\_\_\_\_

To,

Managing Director

Anandrathi wine factory, Vijayapur

Sub: Regarding the permission to visit to your Anandrathi wine factory on 10/08/2017 to 16/08/2017.

Respected Sir,

This is to bring to your kind notice that 9 students of our College studying at B.Sc will visit your esteemed wine factory on 10/08/2017 to 16/08/2017. The concerned faculty members (1) will accompany them. Hence we request you kind self to permit our student to visit your factory. This visit to your factory will make our student aware of various processes in your factory. We look forward to your co-operation in this matter. Further you factory is not responsible for any unforeseen accidents to the students during the visit to the factory.

Thanking you

Vijayapur

9<sup>th</sup>, Aug. 2017

**IQAC, Co-ordinator**  
S.B.Arts & K.C.P.Science College,  
Vijayapur.

Yours faithfully

**Principal,**  
S. B. Arts & KCP Sc. College  
Bijapur

**Head**  
Dept. of Chemistry  
SB Arts & KCP Sc. College,  
Vijayapur.