BioSystems

Wine Analysis made easy

FOODQUALITY
BY BIOSYSTEMS

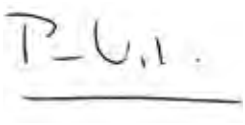
After almost 40 years, BioSystems - a group of 15 companies - is a reliable partner for laboratories over the 5 continents in the fields of **In-vitro Human and Veterinary Clinical Diagnostic**, **Food & Beverage Analysis** and **Monitoring of Bioprocesses.**

Today, the scientific advances in Biotech and Digital technologies drive BioSystems to focus on better understanding your needs and expectations and so provide **Analytical Solutions** to deliver the best **User Experience**.

BioSystems worldwide team of **Scientists, Engineers** and **Expert Professionals** devote their best efforts to continuously design and develop new solutions and improve existing ones.

I'm convinced that **working together**, we will **design** the best solutions to your future needs.

I invite you to explore BioSystems Product List



Pau Vila Cases Ph. D.
Director General
BioSystems S.A.

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Acetaldehyde | Ref. 12820

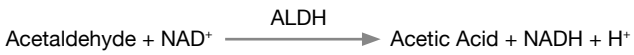
Enzymatic analysis for acetaldehyde determination

Advantages

- Stable working reagent for 3 weeks
- Ready-to-use dedicated reagent
- Liquid calibrator included in the kit

Acetaldehyde is one of the components of the oxidative chain of alcoholic fermentation. Acetaldehyde is also formed in the wine aging process by ethanol oxidation. Acetaldehyde concentration is closely related to SO2 content. This combination is responsible for antioxidant activity.

Acetaldehyde in the sample yields NADH (by the following reaction), which can be measured by spectrophotometry.



Kit volume:	50 mL
Method:	Two-reagent differential, reading at 340 nm
Limit of linearity::	200 mg/L
Limit of detection:	0,1 mg/L

Ammonia | Ref. 12809

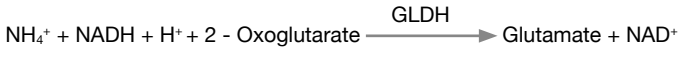
Enzymatic method for ammonia determination

Advantages

- Stable liquid reagent until the expiration date
- Ready-to-use dedicated reagent
- Liquid calibrator included in the kit

Low nitrogen levels have been related to slow fermentation or sulfide production. Conversely, high levels can lead to microbial instability and production of ethyl carbonate.

Ammonia in the sample consumes NADH (according to the following reaction), which is then assayed by spectrophotometry.



Kit volume:	100 mL
Method:	Two-reagent differential, reading at 340 nm
Limit of linearity::	200 mg/L
Limit of detection:	11 mg/L

Acetic Acid | Ref. 12810

Enzymatic method for acetic acid determination

Advantages

- Stable working reagent for 1 month
- Ready-to-use dedicated reagent
- Liquid calibrator included in the kit

Kit volume:	100 mL
Method:	Two-reagent differential, reading at 340 nm
Linealidad:	12 g/L
Limit of detection:	0,03 g/L

Acetic acid is produced during both alcoholic and malolactic fermentations and helps enhance flavors and aromas. When the wine is aerated or remains in contact with air, acetic acid bacteria can multiply, leading to a problem known as “acetic spoilage”. The characteristic aroma of this spoilage is due to ethyl acetate.

Acetate in the sample consumes NADH (by the following reaction), which can be measured by spectrophotometry.

$$\text{Acetate} + \text{ATP} \xrightarrow{\text{AK}} \text{Acetyl Phosphate} + \text{ADP}$$

$$\text{ADP} + \text{PEP} \xrightarrow{\text{PK}} \text{ATP} + \text{Pyruvate}$$

$$\text{Pyruvate} + \text{NADH} \xrightarrow{\text{PK}} \text{Lactate} + \text{NAD}^{+}$$

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Anthocyanins | Ref. 12831

Colorimetric analysis for the assay of anthocyanins

Advantages

- Stable liquid reagent until the expiration date
- Ready-to-use dedicated reagent

Anthocyanins are the tinted pigments in grapes, with the word coming from the Greek root “antos” (flower) and “kyanos” (blue). These pigments are found in both the skin and the pulp.

Anthocyanins are water-soluble pigments that provide the characteristic red color of wine. At 520 nm and under certain conditions, the color is proportional to anthocyanin concentrations. The proposed method determines ionized and ionizable anthocyanins present in the sample. Anthocyanins polymerized with tannins or other compounds cannot be assayed with this method.

Kit volume:	100 mL
Method:	End point with reading at 520 nm
Limit of linearity::	1386 mg/L
Limit of detection:	15 mg/L

Ascorbic Acid | Ref. 12828

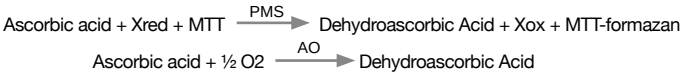
Enzymatic method for ascorbic acid determination

Advantages

- Stable working reagent for 10 days
- Ready-to-use dedicated reagent
- Calibrator included in the kit. Once reconstituted, stable for 20 days

Ascorbic acid is a compound found in ripe grapes at very low levels compared with other acids (30-60 mg/L). It disappears rapidly when grapes are crushed, leading to early oxidation of must. Due to its reducing properties, ascorbic acid is used as an antioxidant.

Ascorbic acid in the sample lowers MTT in the presence of PMS electron carrier, forming dehydroascorbic acid and MTT-formazan that can be assayed by spectrophotometry. To eliminate interferences ascorbic acid is eliminated from the sample by oxidation to dehydroascorbic acid (ascorbate oxidase [AO]).



Kit volume:	90 mL
Method:	Two-reagent differential, reading at 560 nm
Limit of linearity::	150 mg/L
Limit of detection:	1,4 mg/L

Calcium | Ref. 12824

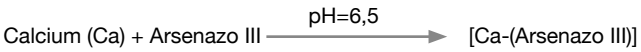
Colorimetric analysis for calcium determination

Advantages

- Stable two-reagent liquid until the expiration date
- Ready-to-use dedicated reagent
- Liquid calibrator included in the kit

Calcium is present in wine at concentrations of 6 to 165 mg/L. Instability due to calcium tartrate appears at 4 to 7 months of fermentation.

Calcium in the sample reacts with 2,7-[bis(2-arsonophenylazo)]-1,8-dihydroxynaphthalene-3,6-disulfonic acid (Arsenazo III). The color increase is directly proportional to the calcium concentration of the sample.



Kit volume:	80 mL
Method:	Two-reagent differential, reading at 635 nm
Limit of linearity:	180 mg/L
Limit of detection:	2 mg/L

Catechins | Ref. 12834

Colorimetric analysis for the assay of catechins

Advantages

- Stable liquid reagent until the expiration date
- Stable working reagent for 4 months
- Ready-to-use dedicated reagent
- Liquid calibrator included in the kit

Catechins reduce and prevent anthocyanin oxidation, keeping them from being precipitated. They are also responsible for the bitterness, astringency, yellow hue, structure and stability of the wine. When catechins are polymerized, they form procyanidins that gradually form complexes with proteins, peptides and polysaccharides.

Catechins in the sample react with the chromogen 4-(dimethylamino)-cinnalmaldehyde in the presence of ethanol and an acidic medium, forming a colored complex that can be assayed by spectrophotometry.

Kit volume:	100 mL
Method:	Two-reagent differential, reading at 620 nm
Limit of linearity:	500 mg/L
Limit of detection:	0,06 g/L

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Citric Acid | Ref. 12825

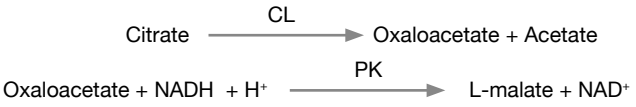
Enzymatic method for citric acid determination

Advantages

- Stable working reagent for 1 month
- Ready-to-use dedicated reagent
- Liquid calibrator included in the kit

Citric acid is an organic acid naturally present in wine that contributes to total wine acidity. Its content is higher in white wine, as the content in red wine drops during malolactic fermentation yielding volatile acids. The permissible legal limit is 1 g/L, and its concentration must be controlled by wine exporters.

Citrate in the sample yields oxaloacetate due to the action of the enzyme known as lyase citrate. All oxaloacetate from citrate in the sample is converted into L-malic acid by the enzyme L-malate dehydrogenase. The disappearance of NADH may be read by spectrophotometry.



Kit volume:	50 mL
Method:	Two-reagent differential, reading at 340 nm
Limit of linearity::	400 mg/L
Limit of detection:	11 mg/L

Color | Ref. 12816

Colorimetric analysis for color determination

Advantages

- Stable liquid reagent until the expiration date
- Ready-to-use dedicated reagent

Wine color plays a major role in the impression of quality. Color is also an important indicator in many winemaking processes. Regular use of this test allows enologists to document and confirm their own impressions.

The wine sample is diluted in a buffer solution that does not alter color-related properties. Absorbance reading at 420 nm, 520 nm and 620 nm allows the chromatic characteristics to be calculated.

Kit volume:	80 mL
Method:	End point monoreagent reading at 420, 520 y 620
Limit of linearity:	16,5 (A_{420}, A_{520} y A_{620})
Limit of detection:	0,113 (A_{420}), 0,144 (A_{520}) y 0,121 (A_{620})

Copper | Ref. 12814

Colorimetric analysis for copper determination

Advantages

- Stable liquid reagent until the expiration date
- Ready-to-use dedicated reagent
- Liquid calibrator included in the kit

Copper is a metal that clearly originates in the process of vinegrowing. The main source is phytosanitary treatments of vineyards to prevent mildew. During harvest, the copper content may be 4 to 6 mg/L. During fermentation its concentration decreases to 0.2-0.3 mg/L due to the formation of copper sulfides or the presence of yeasts that fix the copper contained in the medium.The OIV has set a maximum acceptable limit of copper of 1 mg/L.

Any copper in the sample reacts with 4-(3,5-dibromo-2- pyridylazo)-N-ethyl-N-sulfopropylaniline (PAESA). The color increase is directly proportional to the copper concentration of the sample.

$$\text{Copper (Cu)} + 2\text{PAESA} \xrightarrow[\text{reducing agent}]{\text{pH=4,7}} [\text{Cu(PAESA)}_2]$$

Kit volume:	100 mL
Method:	Two-reagent differential, reading at 560 nm
Limit of linearity:	7 mg/L
Limit of detection:	0,4 mg/L

CO_2 | Ref. 12832

Enzymatic method for CO_2 determination

Advantages

- Stable liquid reagent until the expiration date
- Ready-to-use dedicated reagent
- Liquid calibrator included in the kit

Carbon dioxide is a natural gas produced during fermentation that is dissolved in wines. The addition of CO2 during preparation directly affects the aroma and taste of wine and can enhance freshness and acidity in the mouth, softening the sweetness. However, it can also intensify bitterness and astringency.

According to the coupled reactions described below, carbon dioxide (CO_2) in the sample consumes NADH analogue cofactors that can be assayed by spectrophotometry at 405 nm.

$$\text{Phosphoenolpyruvate} + \text{HCO3} \xrightarrow{\text{PEPC}} \text{Oxaloacetate} + \text{H2PO4}^-$$

$$\text{Oxaloacetate} + \text{Analogue} + \text{NADH} \xrightarrow{\text{MDH}} \text{Malate} + \text{NAD}^+\text{Analogue}$$

Kit volume:	50 mL
Method:	Single-reagent fixed time, reading at 405 nm
Limit of linearity:	1500 mg/L
Limit of detection:	55 mg/L

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D-Gluconic Acid / D-Gluconolactone | Ref. 12811

Enzymatic method for D-gluconic acid / D-gluconolactone determination

Advantages

- Stable liquid reagent until the expiration date
- Ready-to-use dedicated reagent
- Liquid calibrator included in the kit

Kit volume:	100 mL
Method:	Two-reagent differential, reading at 340 nm
Limit of linearity:	2g/L
Limit of detection:	0,003 g/L

D-gluconic acid is an indicator of grape deterioration and sanitary condition

D-gluconic acid in the sample yields NADPH (by the following reaction), which can be measured by spectrophotometry.

$$\text{D-Gluconate} + \text{ATP} \xrightarrow{\text{GK}} \text{D-Gluconate-6-P} + \text{ADP}$$

$$\text{D-Gluconate-6-P} + \text{NADP}^{+} \xrightarrow{\text{6-PGDH}} \text{Ribulose-5-P} + \text{NADPH} + \text{CO}_2 + \text{H}^{+}$$

La D-Gluconolactona se puede determinar mediante el mismo principio tras una hidrólisis alcalina.

$$\text{D-Gluconolactone} + \text{H}_2\text{O} \xrightarrow{\text{pH11}} \text{D-Gluconate}$$

D-Glucose / D-Fructose | Ref. 12800

Enzymatic method for D-glucose / D-fructose determination

Advantages

- Stable liquid reagent until the expiration date
- Working reagent stable until the expiration date
- Ready-to-use dedicated reagent
- Liquid calibrator included in the kit

This test indicates the best moment for grape harvesting and allows alcoholic fermentation to be monitored. It is widely used to determine the dryness of the wine before bottling.

D-fructose and D-glucose in the sample generate NADH (by the following reaction), which can be measured by spectrophotometry. The configuration of these reagents allows D-glucose/D-fructose (total sugars) to be determined if the enzyme PGI is added or D-glucose to be determined if it is not.

$$\text{D-Fructose} + \text{ATP} \xrightarrow{\text{HK}} \text{Fructose-6-Phosphate} + \text{ADP}$$

$$\text{D-Glucose} + \text{ATP} \xrightarrow{\text{HK}} \text{Glucose-6-Phosphate} + \text{ADP}$$

$$\text{Fructose-6-Phosphate} \xrightarrow{\text{PGI}} \text{Glucose-6-Phosphate}$$

$$\text{Glucose-6-Phosphate} + \text{NADP}^{+} \xrightarrow{\text{G6P-DH}} \text{Gluconate-6-Phosphate} + \text{NADPH} + \text{H}^{+}$$

Kit volume:	120 mL
Method:	Two-reagent differential, reading at 340 nm
Limit of linearity:	8 g/L
Limit of detection:	D-Glucose: 0,01 g/L D-Glucose / D-Fructose: 0,01 g/L

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D-Lactic Acid | Ref. 12801

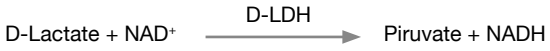
Enzymatic method for D-lactic acid determination

Advantages

- Stable liquid reagent until the expiration date
- Ready-to-use dedicated reagent
- Liquid calibrator included in the kit

The excess of bacteria that are producing D-Lactic acid can inhibit alcoholic fermentation, converting some sugars into D-lactic acid. This is one of the main problems in the wine-making process. Levels above 0.3 g/L of D-lactic acid indicate bacterial contamination.

D-lactic acid in the sample yields NADH (by the following reaction), which can be measured by spectrophotometry.



Kit volume:	100 mL
Method:	Two-reagent differential, reading at 340 nm
Limit of linearity:	0,25 mg/L
Limit of detection:	0,004 g/L

Glycerol | Ref. 12812

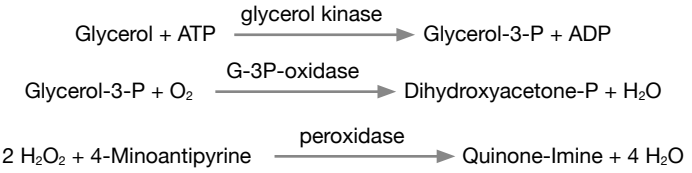
Colorimetric analysis for glycerol determination

Advantages

- Stable one-reagent liquid until expiration date
- Ready-to-use dedicated reagent
- Liquid calibrator included in the kit

Glycerol is an indicator of the quality of finished wine and is extremely important for the mouthfeel. High glycerol concentrations add sweetness, body and fullness to the wine.

Glycerol in the sample yields (by the following reaction), a colored complex that is assayed by spectrophotometry.



Kit volume:	100 mL
Method:	Two-reagent differential, reading at 500 ± 20 nm
Limit of linearity:	20 g/L
Limit of detection:	0,24 g/L

Free Sulfite | Ref. 12813

Colorimetric analysis for free sulfite determination

Advantages

- Stable liquid reagent until the expiration date
- Ready-to-use dedicated reagent
- Liquid calibrator included in the kit

$$SO_2 + \text{Pararosaniline} \xrightarrow{pH=1,0} \text{Paranosaniline-Formaldehyde-}SO_2$$

Kit volume:	400 mL
Method:	Two-reagent differential, reading at 670 nm
Limit of linearity:	150 mg/L
Limit of detection:	3 mg/L

Most sulfur dioxide added to the must or wine combines with different organic compounds. This is the predominant fraction in wine; however, there is another fraction that is not combined, namely, free SO2. Although it is present in lower amounts, its antiseptic and antioxidant properties are superior to those of combined sulfite.

Any free sulfites in the sample react with 4,4'- (4-iminocyclohexa- 2,5-dienylidene) methyl) dianiline (pararosaniline) dye in the presence of formaldehyde and in acidic medium. The color increase of the sample is directly proportional to the free sulfite concentration.

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Histamine | Ref. 12829

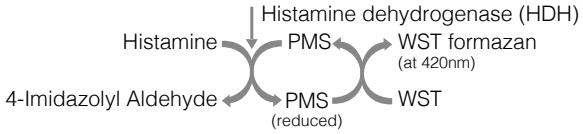
Enzymatic method for the assay of histamine

Advantages

- Stable liquid reagent until the expiration date
- Ready-to-use dedicated reagent
- Liquid calibrator included in the kit

Histamine is a biogenic amine, a chemical compound formed by the action of microorganisms on amino acids present in foods. High amounts of histamine in food can cause organoleptic alterations as well as trigger undesirable effects once consumed and, therefore, histamine concentrations should be controlled. Although it is true that there are currently no global regulations, acceptable limits for histamine concentrations in wines are around 10 ppm.

By means of the coupled reactions described, histamine in the sample yields a colored complex that is quantitated by spectrophotometry.



Kit volume:	100 mL
Method:	Two-reagent differential, reading at 420 nm
Limit of linearity:	160 mg/L
Limit of detection:	2,1 mg/L

Iron | Ref. 12817

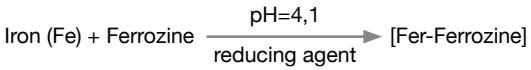
Colorimetric analysis for iron determination

Advantages

- Stable liquid reagent until the expiration date
- Ready-to-use dedicated reagent
- Liquid calibrator included in the kit

Metal components in wine can originate in grapes or the machinery used to make wine. A high iron content can cause clouding due to a lack of solubilization, thus affecting the color and clarity of the wines.

Any iron in the sample reacts with 3-(2-pyridyl)-5,6-bis (4-phenylsulfonic)-1,2,4-triazine (ferrozine) sodium salt in acidic medium and in the presence of a reducing agent. The color increase is directly proportional to the iron concentration of the sample.



Kit volume:	100 mL
Method:	Two-reagent differential, reading at 560 nm
Limit of linearity:	30 mg/L
Limit of detection:	0,1 mg/L

L-Malic Acid | Ref. 12803

Enzymatic method for L-malic acid determination

Advantages

- Stable liquid reagent until the expiration date
- Stable working reagent for 4 months
- Ready-to-use dedicated reagent
- Liquid calibrator included in the kit

$$\text{L-Malate} + NAD^+ \xrightarrow{\text{L-MDH}} \text{Oxaloacetate} + NADH$$

$$\text{Oxaloacetate} + NADH + H^+ \xrightarrow{\text{GOT}} \text{Aspartate} + \text{2-Oxoglutarate}$$

Kit volume:	100 mL
Method:	Two-reagent differential, reading at 340 nm
Limit of linearity::	4 g/L
Limit of detection:	0,016 g/L

L-malic acid is responsible for the sharply acidic, green apple flavor in wine. It's fermentation yields L-lactic acid and causes perceived acidity to soften.

L-malic acid in the sample yields NADH (by the following reaction), which can be measured by spectrophotometry. The equilibrium of this reaction moves toward L-malic acid formation. The enzyme glutamate-oxaloacetate transaminase (GOT) causes the equilibrium to shift by eliminating oxaloacetate, which is converted into L-aspartate in the presence of L-glutamate.

L-Lactic Acid | Ref. 12802

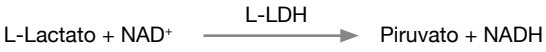
Enzymatic method for L-lactic acid determination

Advantages

- Stable liquid reagent until the expiration date
- Ready-to-use dedicated reagent
- Liquid calibrator included in the kit

L-lactic acid is the product of the metabolism of malic acid during the malolactic fermentation. L-lactic acid is perceived as less acidic and softer on the palate compared to malic acid.

L-lactic acid in the sample yields NADH (by the following reaction), which can be measured by spectrophotometry.



Kit volume:	100 mL
Method:	Two-reagent differential, reading at 340 nm
Limit of linearity:	3 g/L
Limit of detection:	0,02 mg/L

Magnesium | Ref. 12878

Colorimetric method for the determination of magnesium content

Advantages

- Liquid reagent are stable for 15 days
- Dedicated reagent ready for use
- Liquid calibration standard included in the kit

Magnesium, along with potassium are essential nutrients for the nutrition of vines. Magnesium helps with the transportation and accumulation of sugars in the grape. Along with other minerals it helps neutralise organic acids in the grape and the must.

The magnesium present in the sample reacts with xylidyl blue in an alkaline medium, producing a coloured complex that can be determined spectrophotometrically. The presence of EGTA in the reagent prevents calcium interference.

Kit volume:	100 mL
Method:	Mono-reagent endpoint, reading at 520 nm
Limit of linearity:	240 mg/L
Limit of detection:	9 mg/L

pH | Ref. 12876

Colorimetric method for the determination of pH

Advantages

- Liquid reagent stable until expiry date
- Dedicated reagents ready for use
- Liquid calibration standards included in the kit

In musts and wines the pH varies depending on the ripeness of the grapes, the concentration of organic acids at the time of harvest, the variety of the grape, the presence and metabolism of micro-organisms and the fermentation temperature etc. The appearance of tartrate precipitates during the wine-making process will alter the final pH of the wine.

The hydrogen ions in the sample alter the pH of the sample/buffer mix and can be measured spectrophotometrically with the bromophenol blue indicator.

Kit volume:	100 mL
Method:	Two-reagent differential, reading at 600 nm
Measurement range:	3,00 a 4,40

Polyphenols | Ref. 12815

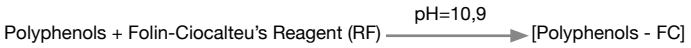
Colorimetric analysis for polyphenols determination

Advantages

- Stable liquid reagent until the expiration date
- Ready-to-use dedicated reagent
- Liquid calibrator included in the kit

Phenol components significantly enhance the antioxidant properties, color and mouthfeel of red wines. The importance of these phenol components in sensory perception requires assay at all stages of the winemaking process.

Any polyphenols in the sample react with Folin-Ciocalteu´s reagent in basic medium. The color increase is directly proportional to the polyphenols concentration of the sample.



Kit volume:	80 mL
Method:	Two-reagent endpoint, reading at 670 or 750 nm
Limit of linearity:	3000 mg/L
Limit of detection:	60 mg/L

Potassium | Ref. 12823

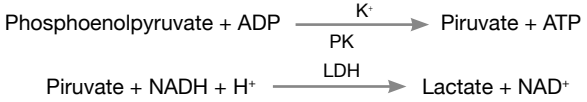
Enzymatic method for potassium determination

Advantages

- Stable liquid reagent until the expiration date
- Ready-to-use dedicated reagent
- Liquid calibrator included in the kit

The amount of potassium in grape must varies between 600 and more than 2500 mg/L in certain varieties of red wine. During véraison, soil potassium moves toward the fruit where it forms soluble potassium bitartrate. Alcohol and low temperatures can reduce its solubility, leading to precipitation.

Potassium in the sample consumes NADH (by the following reaction), which can be measured by spectrophotometry.



Kit volume:	80 mL
Method:	Two-reagent differential, reading at 340 nm
Limit of linearity:	1500 mg/L wine | 4000 mg/L Most
Limit of detection:	8 mg/L

Primary Amino Nitrogen (PAN) | Ref. 12807

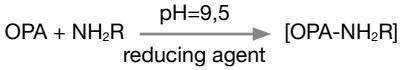
Colorimetric analysis for primary amino nitrogen determination

Advantages

- Stable liquid reagent until the expiration date
- Stable working reagent for 12 months
- Ready-to-use dedicated reagent
- Liquid calibrator included in the kit

Nitrogen compounds (molecules containing a primary amine nitrogen) in must and wine play a key role in fermentation and the potential of microbial stability.

Any molecules in the sample that contain a primary amino nitrogen react with o-phthaldialdehyde (OPA) in the presence of a reducing agent in basic medium, yielding a chromogen that is assayed spectrophotometrically.



Kit volume:	100 mL
Method:	Two-reagent differential, reading at 340 nm
Linealidad:	400 mg/L
Limit of detection:	1 mg/L

Pyruvic Acid | Ref. 12826

Enzymatic method for pyruvic acid determination

Advantages

- Stable liquid reagent until the expiration date
- Stable working reagent for 2 months
- Ready-to-use dedicated reagent
- Liquid calibrator included in the kit

Pyruvic acid is an organic acid naturally present in wine and one of the acids that most influences its body and mouthfeel. Pyruvic acid is a result of the fermentation process and contributes to the organoleptic properties of wine, but must be controlled because selective sulfite-binding shortens the life of the wine.

Pyruvate in the sample yields oxalacetate due to the action of the enzyme known as D-lactate dehydrogenase. This reaction consumes NADH that is oxidized to NAD+ and the disappearance of the latter can be measured by spectrophotometry.

Kit volume:	100 mL
Method:	Two-reagent differential, reading at 340 nm
Limit of linearity::	400 mg/L
Limit of detection:	6 mg/L

Sucrose / D-Glucose / D-Fructose | Ref. 12819

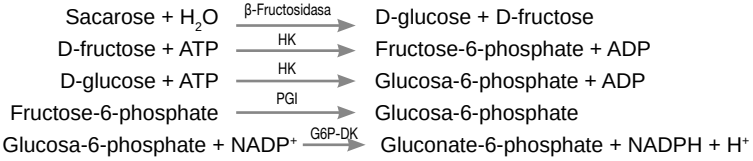
Enzymatic method for sucrose or Sucrose / D-Glucose / D-Fructose determination

Advantages

- Stable liquid reagent until the expiration date
- Stable working reagent for 3 months
- Ready-to-use dedicated reagent
- Liquid calibrator included in the kit

Precise analysis of sucrose or total sugar is important for many winecellars in two winemaking operations. Sparkling wine (cava, champagne, etc.) production: adding sucrose once alcoholic fermentation has been carried out in order to achieve a secondary fermentation that produces CO_2, which is retained in the wine.

Sucrose, D-fructose and D-glucose in the sample generate NADPH (by the following reaction), which can be measured by spectrophotometry.



Kit volume:	60 mL
Method:	End-point/two-reagent differential, reading at 340 nm
Limit of linearity:	Sucrose 4 g/L, Suc./D-Gluc./D-Fruc. 8 g/L
Limit of detection:	Sucrose 0,08 g/L, Suc./D-Gluc./D-Fruc. 0,07 g/L

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Tartaric Acid | Ref. 12808

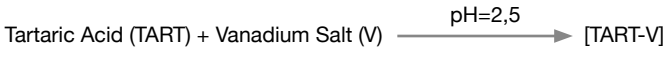
Colorimetric analysis for tartaric acid determination

Advantages

- Stable liquid reagent until the expiration date
- Ready-to-use dedicated reagent
- Liquid calibrator included in the kit

Tartaric acid is the main acid of wine that can become insoluble, forming various salts. This acid produces the fruity aromas and freshness of wines and is the most commonly used acidifier.

Any tartaric acid in the sample reacts with vanadium salt in acidic medium, forming a colored complex that is assayed by spectrophotometry.



Kit volume:	100 mL
Method:	Two-reagent differential, reading at 520 nm
Measurement range:	0,06 a 6 g/L
Limit of detection:	0,06 g/L

Total Acidity | Ref. 12846

Colorimetric analysis for the assay of total acidity

Advantages

- Stable liquid reagent until the expiration date
- Ready-to-use dedicated reagent
- Liquid calibrator included in the kit

La acidez total es la suma de los ácidos valorables que contiene el vino o el mosto, como el ácido málico, ácido tartárico, ácido láctico, etc., excepto el ácido carbónico y el ácido sulfuroso.

Los ácidos de la muestra modifican el pH en la mezcla de reacción que, en presencia del indicador azul de bromotimol (BTB), pueden ser medidos espectrofotométricamente.

Determinar la acidez total en el mosto permite garantizar una buena fermentación, también se recomienda en el vino puesto que es un factor clave para la conservación, estabilidad del vino en el tiempo y además, juega un papel muy importante en el equilibrio y redondez del vino en boca.

Kit volume:	100 mL
Method:	Two-reagent differential, reading at 340 nm
Linealidad:	12 g/L

Total Sulfite | Ref. 12806

Colorimetric analysis for total sulfite determination

Advantages

- Stable liquid reagent until the expiration date
- Ready-to-use dedicated reagent
- Liquid calibrator included in the kit

$$SO_2 + \text{R-S-S-R (DTNB)} \xrightarrow{pH=1,0} \text{R-S-}SO_2 + \text{S-R}$$

Kit volume:	200 mL
Method:	Two-reagent differential, reading at 405 nm
Limit of linearity:	400 mg/L
Limit of detection:	1 mg/L

Sulfite is the main preservative of wines and musts, due to its antiseptic properties on yeasts and bacteria; it also has antioxidant properties. According to Council Regulation (EC) No 1493/1999 and Council Regulation (EC) Nº 1622/2000, the sulfur dioxide content of wine is limited, as it is considered to be a slightly toxic substance from the point of view of its effects on human physiology.

Total sulfites in the sample react with 5-5'-dithio-2-nitrobenzoic (DTNB) acid in basic medium. Cleavage of the disulfide bond (R-S-S-R) of DTNB by a sulfite molecule yields the 5-mercaptan- 2-nitrobenzoate molecule, which absorbs at 405 nm. The color increase of the sample is directly proportional to the total sulfite concentration of the sample.

Multical | Ref. 12818

Multiparameter calibrator

MULTICAL is a multiparameter calibrator with five synthetic matrix liquid levels (5 x 10 mL). It contains various analaytes at adequate concentrations for the calibration of the measurement procedures.

The traceability of the results in samples to reference materials or systems of higher metrological hierarchy is only ensured when the reagents and measurement procedures recommended by BioSystems are used.

Parameter	U	1	2	3	4	5
Acetic acid	g/L	0,15	0,30	0,60	0,90	1,20
Ammonia	mg/L	23	45	90	135	180
Citric acid	mg/L	45	90	180	270	360
D-Gluconic Acid	g/L	0,20	0,40	0,80	1,20	1,60
D-Glucose	g/L	0,90	1,80	3,60	5,40	7,20
D-Glucose/D-fructose	g/L	0,90	1,80	3,60	5,40	7,20
Glicerol	g/L	0,113	0,225	0,450	0,675	0,900
Ácido D-láctico	mg/L	0,028	0,056	0,113	0,169	0,225
Ácido L-láctico	g/L	0,34	0,68	1,35	2,03	2,70
Ácido L-málico	g/L	0,45	0,90	1,80	2,70	3,60
PAN	mg/L	45	90	180	270	360
Suc./D-gluc./D-fruc.	g/L	0,90	1,80	3,60	5,40	7,20

Traceability: aqueous reference standard

Ions Multical | Ref. 12841

Multiparameter calibrator

IONS MULTICAL. 5 levels with 10 mL. Multiparameter calibrator with five synthetic matrix liquid levels that contain various metals at adequate concentrations to calibrate the measurement procedures.

The concentration values assigned to each component and their traceability is ensured by using the reagents and measurement procedures recommended by BioSystems.

Parameter	U	1	2	3	4	5
Calcium	mg/L	20,3	40,5	81,0	121,5	162,0
Copper	mg/L	0,8	1,6	3,2	4,7	6,3
Iron	mg/L	3,4	6,8	13,5	20,3	27,0
Potassium	mg/L	34	68	135	203	270
Magnesium	mg/L	4,5	9,0	18,0	27,0	36,0

Traceability: aqueous reference standard

Control Wine (white and red) | Ref. 12821 / 12822

Multiparameter calibrator

Control Wine (white and red) is a wine (10 x 5 mL) that contains various components at adequate concentrations for quality control in laboratories. The product is designed for intra-laboratory quality control and is supplied with acceptable value intervals.

Traceability is only ensured when the reagents and measurement procedures recommended by BioSystems are used.

Component	U
Acetic acid	g/L
Ammonia	mg/L
Iron	mg/L
D-Gluconic acid	g/L
D-glucose / D-fructose	g/L
D-glucose	g/L
Glycerol	g/L
L-Lactic acid	g/L
L-Malic acid	g/L
Primary Amine Nitrogen	mg/L
Polyphenols	mg/L
Tartaric acid	g/L
Citric acid	mg/L

Sulfite Control | Ref. 12827

Sulfite (I and II) Control is a synthetic liquid material that contains stabilized sulfite at adequate concentrations for quality control in laboratories. It does not contain preservatives that could interfere with the measurements.

The concentration values assigned to each level are shown in the attached tables. The values are traceable to the unit of mass. Traceability is ensured only by using the measurement reagents and procedures recommended by BioSystems. The acceptable ranges suggested have been prepared based on prior experience in interlaboratory variability and are provided only as a guideline, as each laboratory should establish its own precision parameters.

Component	Level	Value	Limits	Units
Sulfite	I	40	36-44	mg/L
(free & total)	II	80	72-88	mg/L

High Glucose / Fructose Control | Ref. 18069

BioSystems offers a 200 g/L aqueous standard in order to facilitate work with D-Glucose/D-Fructose techniques that include a pre-dilution.

Casein | Ref. 14113

ELISA method

Advantages

- Fast, standard method
- High sensitivity
- Liquid reagent, stable until the expiration date
- Easy sample preparation

Casein is an allergenic protein present in cow's milk and dairy products made from cow's milk. The presence of traces of these proteins must be labeled due to the risk it poses to the health of people with allergies, as set forth in the legislation. In addition to foods that naturally contain casein, there may be traces of these proteins in processed foods due to cross-contamination or the use of additives. Caseins are used as clarifier or fining agent in the winemaking process.

Casein reagent is a sandwich enzyme-linked immunosorbent assay (ELISA) for the quantitative analysis of casein traces in samples of wine, juice, cookies, meat products, chocolate and other food products.

Presentation:	96 wells
Method:	Sandwich ELISA, reading at 450 nm
Limit of detection:	0,04 ppm
STD Concentration:	0 - 0,2 - 0,6 - 2 - 6 ppm

Histamine "High Sensitivity" | Ref. FCE3100

ELISA method

Advantages

- High sensitivity
- Liquid reagent, stable until the expiration date
- Easy sample preparation

Histamine is a biogenic amine present in certain food with high concentrations of protein or foods exposed to fermentation processes. Histamine is created by certain microorganisms that affect the amino acid histidine. Histamine intake by sensitive individuals produces undesireable effects, such as headaches or skin reactions; hence, it should be controlled.

High-sensitivity ELISA of histamine is a competitive enzyme-linked immunoabsorbent assays for the quantitative analysis of histamine in wine, fish, cheese and meat.

Histamine in the sample is quantitatively derivatized to N-acyl-histamine by using an acylating reagent. The microplate wells are coated with histamine. In a first incubation, acylated histamine in the sample or reference standard competes with fixed histamine to bind to anti-histamine antibodies.

Presentation:	96 wells
Method:	Competitive ELISA, reading at 450 nm
Limit of detection:	0,15 ppb
STD Concentration:	0 - 25 - 100 - 250 - 500 ppb

Lysozyme | Ref. 14122

ELISA method

Advantages

- Fast, standard method
- High sensitivity
- Liquid reagent, stable until the expiration date
- Easy sample preparation

Lysozyme is an allergenic protein contained in eggs and egg products. As set forth by law, the presence of traces of this protein should be labeled due to the risk posed to the health of allergic individuals. In addition to foods that naturally contain lysozyme, there may be traces of this protein in processed foods due to cross-contamination or the use of additives. Lysozyme is used as a preservative in the winemaking process.

Lysozyme reagent is a sandwich enzyme-linked immunosorbent assay (ELISA) for the quantitative analysis of casein traces in wine and cheese samples.

Presentation:	96 wells
Method:	Sandwich ELISA
Limit of detection:	2 ppb
STD Concentration:	0 - 25 - 100 - 250 - 500 ppb

Ovalbumin | Ref. 14125

ELISA method

Advantages

- Fast, standard method
- High sensitivity
- Liquid reagent, stable until the expiration date
- Easy sample preparation

Ovalbumin is an allergenic protein contained in eggs and egg products. As set forth by law, the presence of traces of this protein should be labeled due to the risk posed to the health of allergic individuals. In addition to foods that naturally contain ovalbumin, there may be traces of this protein in processed foods due to cross-contamination or the use of additives. Ovalbumin is used as a clarifier finding agent in the winemaking process.

Ovalbumin reagent is a sandwich enzyme-linked immunosorbent assay (ELISA) for the quantitative analysis of casein traces in wine and food samples.

Presentation:	96 wells
Method:	Sandwich ELISA
Limit of detection:	4 ppb
STD Concentration:	0 - 25 - 100 - 250 - 500 ppb

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Ochratoxin-A ELISA | Ref. 14108 Rapid Test | Ref. 14203

ELISA Method / Rapid Test

Ochratoxin-A is a nephrotoxic and hepatocarcinogenic microtoxin produced by *Penicillium verrucosum and P. viridicatum* as well as by several species of Aspergillus, such as A. ochraceus in warm tropical areas of the world. Ochratoxin-A has been found in several cereals and other plant products, in coffee, wine and animal feed.
The legally-established maximum levels in Europe for ochratoxin-A depend on whether the food is being used directly for human consumption or as a raw material for prepared products, varying between 2 and 20 µg/kg (ppb).

Advantages of ELISA

- High sensitivity
- Validated for wine

The ELISA Ochratoxin-A kit is a competitive enzyme immunoassay for quantitative analysis of the Ochratoxin-A in foods and feeds (corn, rice, wheat, sorghum, barley, oat, rye, coffee, cacao, pulses and wine).

Presentation:	96 wells
Method:	Competitive ELISA, reading at 450 nm
Limit of detection:	0,3 ppb
STD Concentration:	0 - 0,0625 - 0,125 - 0,25 - 0,5 - 1 ppb

Advantages of Rapid Test

- Results in 10 minutes
- Easy to use
- Includes everything necessary for on-site analysis
- Low cost
- High sensitivity
- Detection limits in line with current legislation

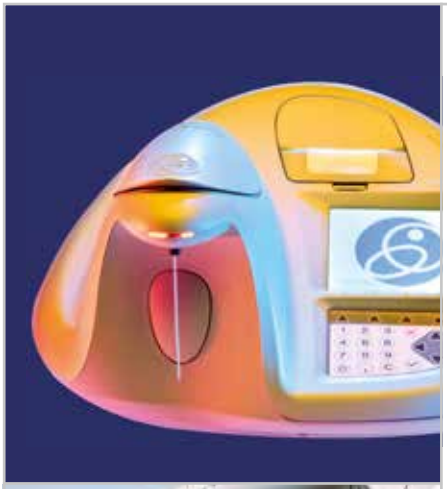
The Ochratoxin-A Rapid Test is a competitive enzyme immunoassay on nitrocellulose for screening Ochratoxin-A in wines (white, rosé and red)..

Presentation:	10 test
Method:	Rapid Test (Ezyme immunoassay)
Limit of detection:	0,3 ppb

Y15 / Y25 / Y350 are open analyzers.

In conjunction with the reagent line, the BioSystems Analyzers make it possible to monitor the entire vinification process. The system adjusts to the various sample types that the enologist needs to analyze.

Y350 Technical Specifications | Code 80176



Optical System

Range of measurment: 0-3.5 A
all wavelengths
Wavelengths: 280, 340, 405, 420, 505, 520, 560, 620, 635, 670, 750 (nm)
Light Source: LEDs
Settings: monochromatic and bichromatic

Thermostat System

Peltier system from 25-40 °C

Fluidic System

Continuous flow system with peristaltic pump incorporated
Stepper motor pump operation
Sipping volume can be programmed from 100 µL to 5 mL
Automatic adjustment of sample volumen
Automatic adjustment of sample position

Printer Screen and Keyboard

Thermic printer
Screen: graphic LCD lighted screen 320 x 240 px
Keyboard: tactile membrane

Methods of Calculation

Absorbance
End Point
Differential Mode
Fixed Time
Kinetic

Calibration

Factor
Calibrador
Curva de calibración

Calibration Curve

Up to 8 Calibration points
Up to 3 replicates per point

Quality Control

2 controls per test
Levey-Jennings control chart
Westgard´s Rules

Installation Characteristics

Voltage: 100V-240 V
Frequency: 50/60 Hz
Maximum power: 30 W
Temperature: 10-35 °C
Max Rel humidity: 75 %
Height: <2000 m
Dimensions: 420 x 350 x 216 mm
Weight: 4 kg

Accessories

Battery Pack
- Capacity 2000 mAh
- Duration: 2 hrs
0,2, 1 and 10 mm flow quartz cuvette
10 mm flow glass cuvette
1 mm glass cuvette + adapter
10 mm quartz cuvette

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Y15/c Technical Specifications

Code 83106
Code 83106c

Random Access automatic analyser.
Photometric reading directly on the reaction rotor.

Test rate	150 tests/hour (75 results/hour)
Number of rack positions — Y15	4 (samples and/or reagents)
Number of rack positions — Y15c	2 (samples and/or reagents)
Number of samples per rack	24 (multiuse racks)
Number of samples per rack	10 (20 and 50 mL bottles)
Number of cooled reagents — Y15c	10 (20 mL bottles) and 10 (50 mL bottles)
Maximum number of samples/reagents — Y15	72 samples / 30 reagents
Maximum number of samples/reagents — Y15c	48 samples / 30 reagents
Sample tubes	ø13 mm, ø15 mm (maximum height 100 mm)
Standard vial	ø13 mm
Programmable reagent volume — A / B	10 µL - 600 µL / 10 µL - 200 µL
Programmable sample volume	2 µL - 80 µL
Removable methacrylate rotor	
Number of wells in the rotor	120
Automatic pre- and post-dilutions	
Permissible reaction volumes	180 µL - 800 µL
Measurement range	from -0,05 A to 3,6 A
Filter drum configuration	340, 405, 420, 520, 560, 600, 620, 635, 670 (nm)
Dimensions	840 x 670 x 615 (mm) (length x deep x height)
Weight	45 kg

Y25

Technical Specifications | Code 83107

Random Access automatic analyser.
Photometric reading directly on the reaction rotor.

Test rate	240 tests/hour (120 results/hour)
Number of cooled reagents	30
Positions for uncooled rack	3 (multipurpose rack)
Number of samples per rack	24
Maximum number of samples	10 (20 mL and 50 mL bottles)
Sample tubes	ø13 mm, ø15 mm (maximum height 100 mm) ø13 mm
Number of reagents per rack	10
Max. number of uncooled reagents	20
Reagent bottles	20 mL y 50 mL
Programmable reagent volume — A / B	10 µL - 440 µL / 10 µL - 200 µL
Programmable sample volume	2 µL - 40 µL
Removable methacrylate rotor	
Number of wells	120
Automatic pre- and post-dilutions	
Reaction volume range	180 µL - 680 µL
Measurement range	from -0,05 A to 3,6 A
Filter drum configuration	340, 405, 420, 520, 560, 600, 620, 635, 670 (nm)
Dimensions	1080 x 695 x 510 (mm) (length x deep x height)
Weight	73 kg

Y200 Technical Specifications | Code 83020

Speed

200 tests/hour (200 resultados / hora)

Capacity

88 reagent bottles
(including reagents and samples)
Maximum 44 bottles - 60 mL
Maximum 87 botles - 20 mL
Maximum 87 samples (tube or pediatric well)

Sistema Fluídico

RA volume from 90 µL to 300 µL
RB volume from 10 µL to 100 µL
Sample volume from 2 µL to 40 µL
Reaction volume from 180 µL to 440 µL
Level and clot detector

Optical System

LED + Hard Coating Filter
Main photodiode + reference photodiode
Wavelenghts
340, 405, 420, 430, 505, 520, 560, 600, 620
635, 750 (nm)

Other Characteristics

Dimensions 1077 x 690 x 680 (mm)
166 Kg

Y400 Technical Specifications | Code 83040

Speed

400 tests/hour (400 results/hour)

Capacity

135 samples
(90 with automatic barcode reading)
88 reagent bottles (refrigerated)
Removable blade with 120 reaction cuvettes (autowashable)

Fluid System

RA volume from 90 µL to 450 µL
RA volume from 10 µL to 300 µL
Sample volume from 2 µL to 40 µL
Reaction volume from 180 µL to 600 µL
Level and clot detector

Optical System

LED + Hard Coating Filter
Main photodiode + reference photodiode
Wavelenghts
340, 405, 420, 430, 505, 520, 560, 600, 620 635, 750 (nm)

Other Characteristics

Dimensions 1200 x 720 x 1258 (mm)
210 Kg

- Certified Management System
- EN ISO 9001
- EN ISO 13485

BTS/06-19 99815

BioSystems

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