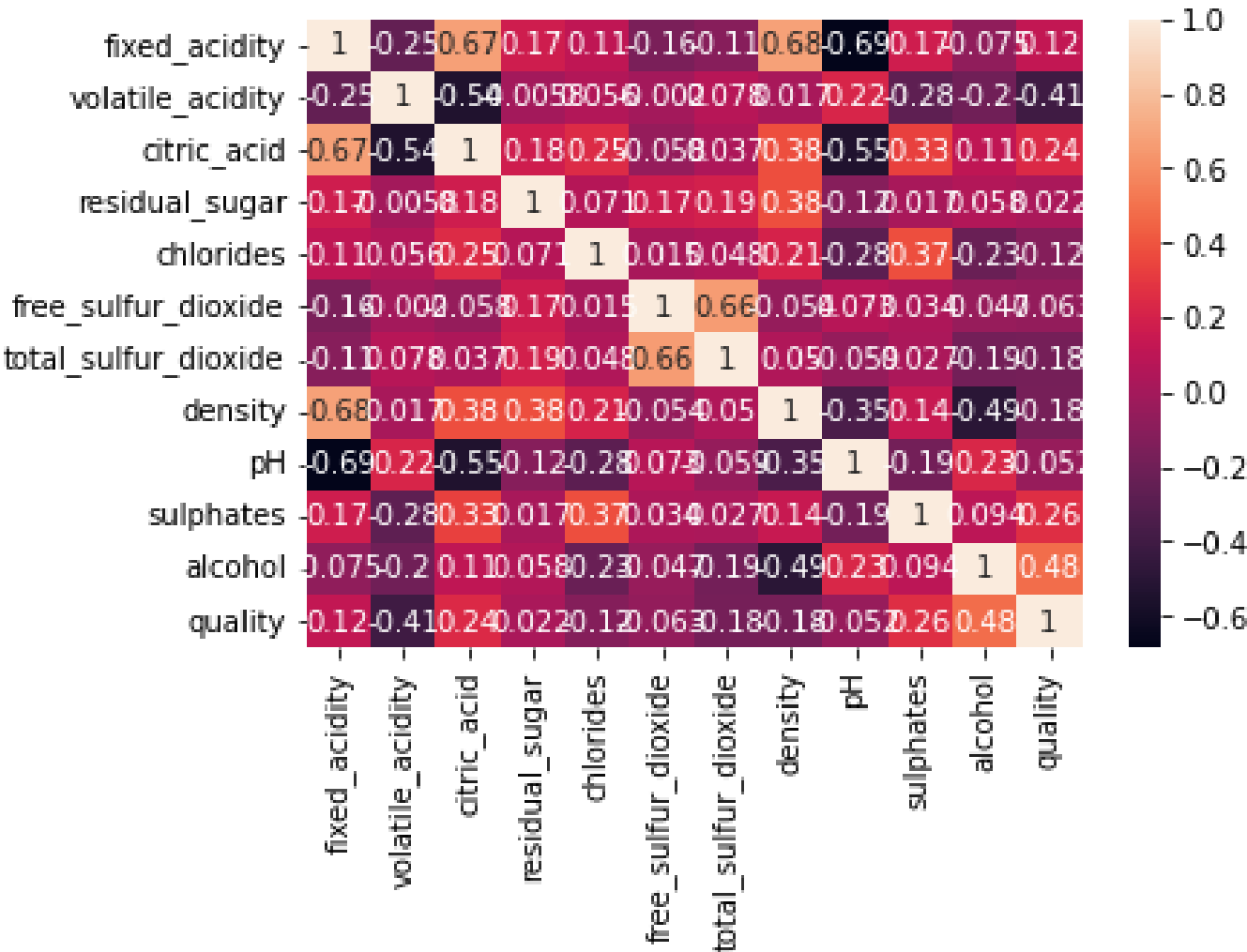
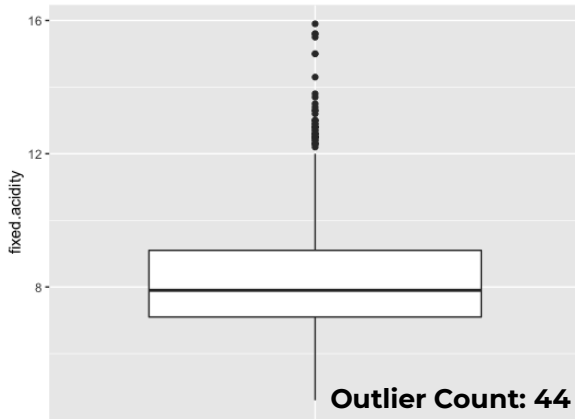
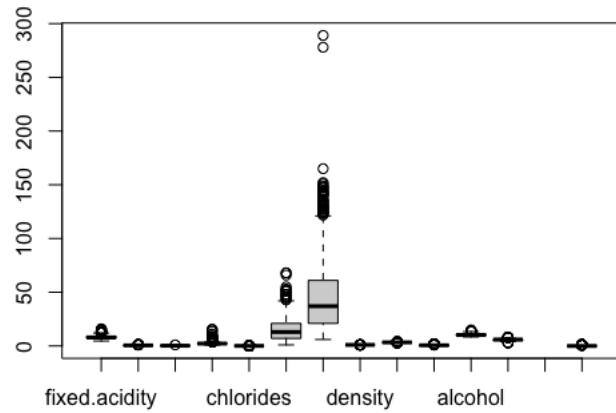


Correlation Matrix



Boxplots



Fixed Acidity: acids that do not evaporate easily; found naturally in grapes or occur during fermentation

Fixed Acids: tartaric, citric, malic (occur naturally in grapes), succinic (fermentation)

Expressed in Dataset: as tartaric acid



Volatile Acidity: steam distillable acids in wine: primarily acetic acid, also lactic, formic, butyric, and propionic acids

Expressed in Dataset: as acetic acid

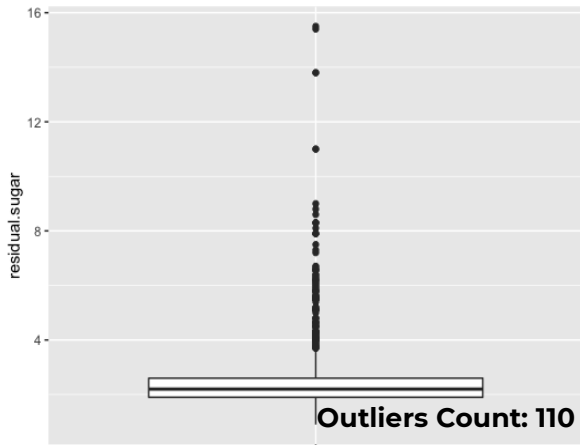
Notes: Acetic acid <400 mg/L in a new, dry table wine. Typical levels from undetectable to 3g/L. Aroma detection of acetic acid in red wine from 600 mg/L and 900 mg/L. Thresholds can go up to 3 g/L (3000 mg). Legal Limit for wine labeling/sale (in U.S.) is 1.2 g (1200 mg).



Citric Acid: weak organic acid (fixed acid)

Properties: antimicrobial activity on molds and bacteria; relationship with antioxidants by chelating metal ions to prevent browning.

Relationship to Volatile Acid: citric-sugar co-metabolism can also increase the formation of volatile acid in wine which can affect the wine aroma negatively if present at excessive levels.



Residual Sugar: The sugars left unfermented in a finished wine

Labeling terms, still wines in the EU:

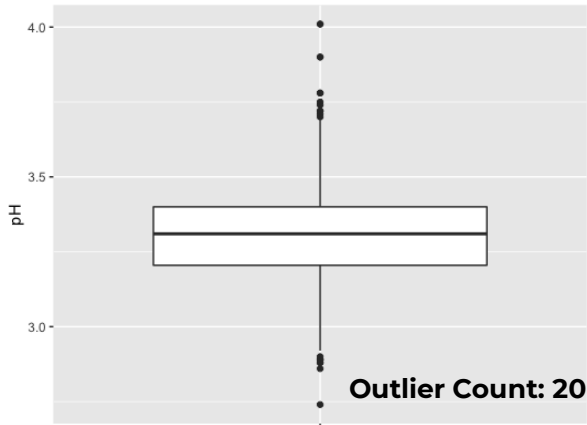
Up to 4 g/l--- Dry,
 4 g/l – 12 g/l--- Medium dry
 12 g/l – 45 g/l--- Medium (Medium sweet)
 More than 45 g/l--- Sweet **(none of these in our dataset)**

Dry Count: 1050

Medium Dry Count: 89

Medium Count: 4

I should have done a better job of wrangling our cleaned dataset before suggesting. Not enough variety for a good comparison with cleaned data.



pH: pH level of a wine typically ranges from 3 to 4.

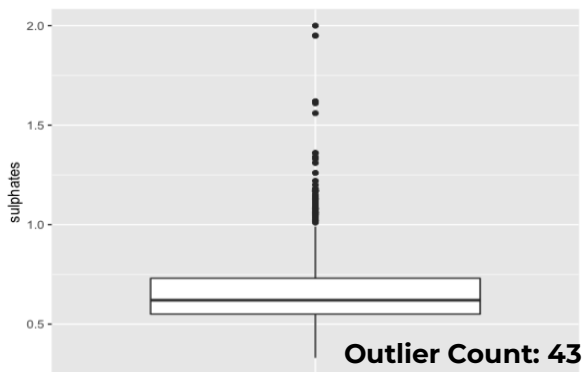
High acid wines> more likely to improve with time.

Color: Red wines with higher acidity, lower pH >bright ruby color

Higher pH, less-acidic: can take on a blue, purple, or brown hue due to oxidation. Oxidation can be a problem regardless of pH, but the reaction occurs quicker at a higher pH.

Sometimes when low acid is combined with high pH, a flabby, soapy feeling can be present.

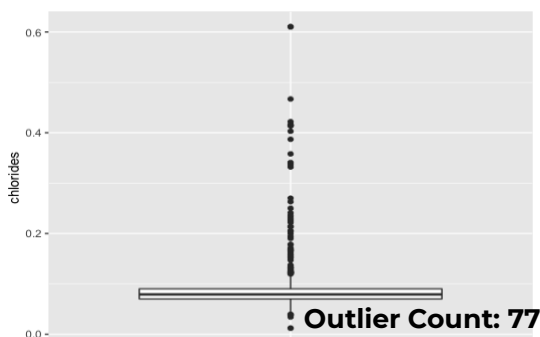
Stability of high acid/low pH wines helps during aging, but high pH wines are more prone to microbes. That is corrected by adding S02. Takes a lot more sulfur dioxide to get the same effect in a wine at pH level of 4 as one with 10 times more acidity at pH level of 3. Wines with higher pH require more sulfites to protect them from oxidation.



Sulphates:

Expressed in dataset as: potassium sulphate

By adding potassium metabisulfite after you've stopped fermentation completely you can then back sweeten a wine with little risk of rekindling the fermentation of newly added sugar.



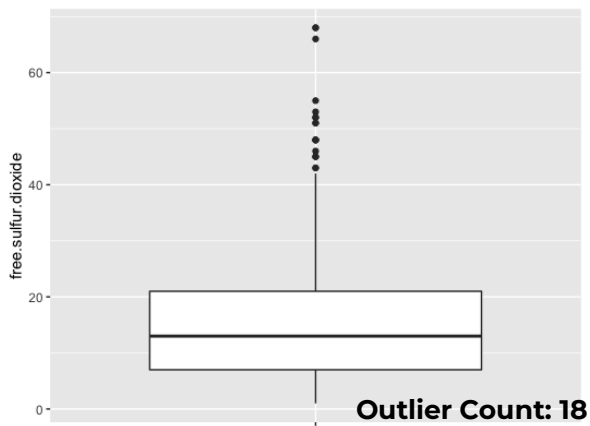
Chlorides: Amount of sodium chloride present in wine.

Generally relatable to the salinity of the soil.

Affects on quality: Detectable in red wine: .52 g/L (520 mg/L)

Recognition in red wine: 2.98 g/L (2980 mg/L). Can't find

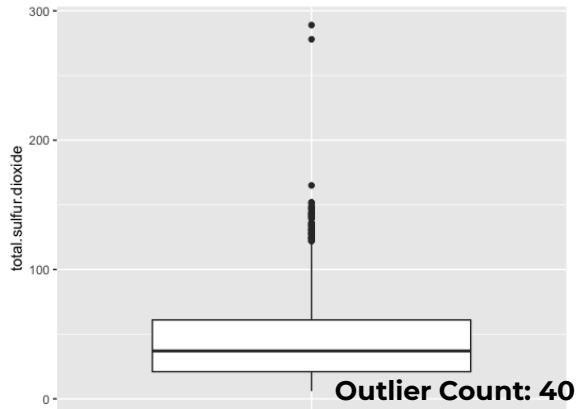
Portugal data. Argentina has most stringent guidelines at .6 g/L (600 mg/L). Australia allows for 1 g/L (1000 mg/L).



Free Sulfur Dioxide: free form of SO₂

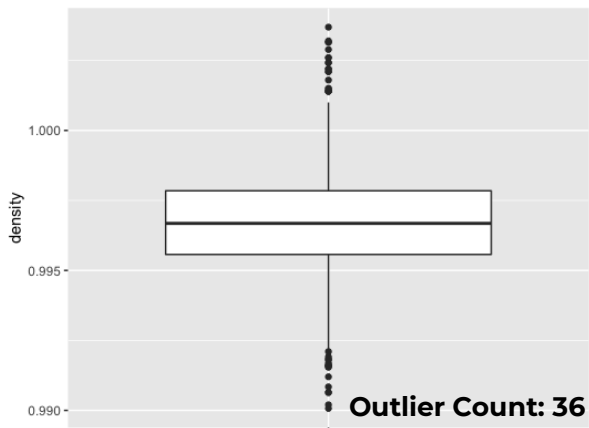
FSO₂ and the pH determine how much sulfur dioxide is available to protect the wine from oxidation.

Too much FSO₂ can be perceptible to consumers, masking the wine's aromas and inhibiting its ability to breathe. In high enough concentrations, contributing a sharp/metallic/bitter flavor or sensation.



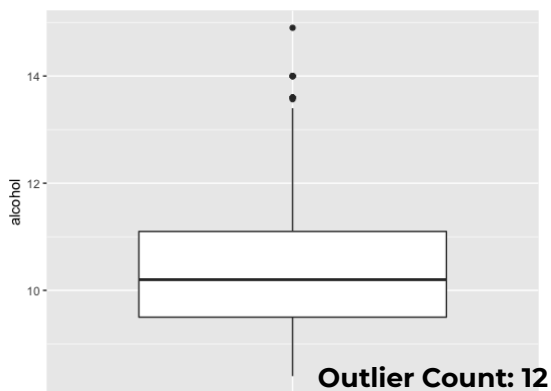
Total Sulfur Dioxide: The SO₂ that is free in the wine + portion that is bound to other chemicals in wine.

Maximum allowable legal amount is 350 ppm



Density: before fermentation the density of wine juice is thicker than water.

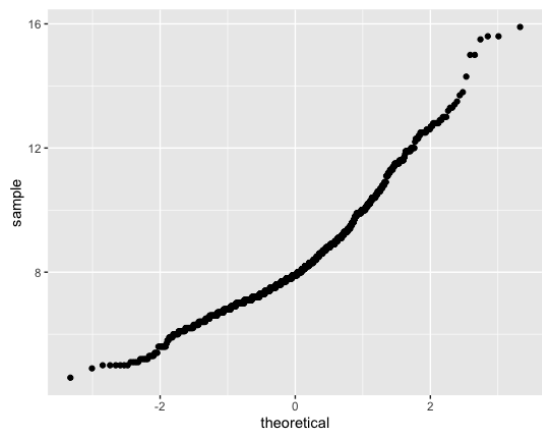
As the yeast consumes the sugar in the wine, and converts it to alcohol, the liquid is less dense. After fermentation, the specific gravity of wine often less than 1.00, usually 0.996.



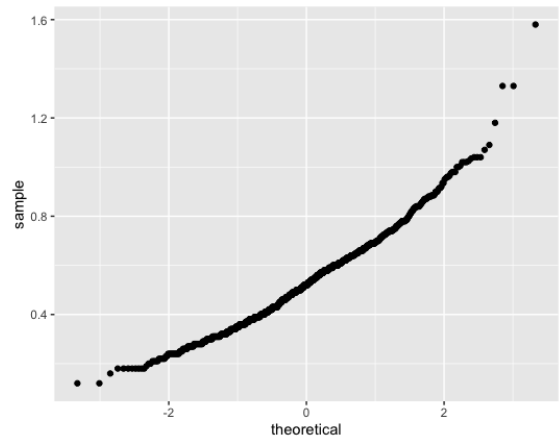
Alcohol:

Measured by recording (starting specific gravity - final specific gravity) * 131

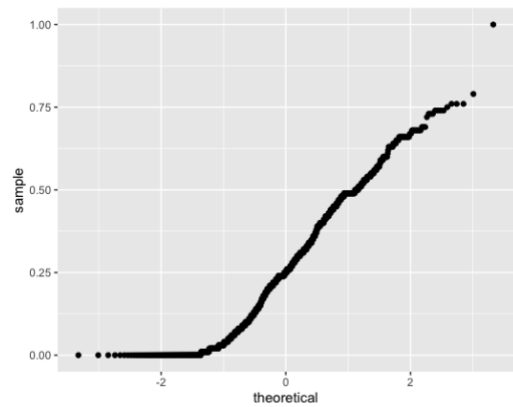
Normal Probability Plots



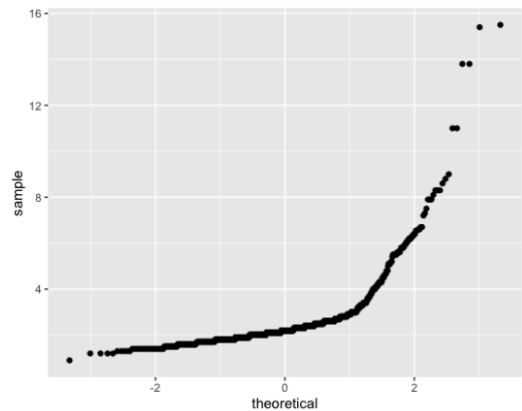
Fixed Acidity



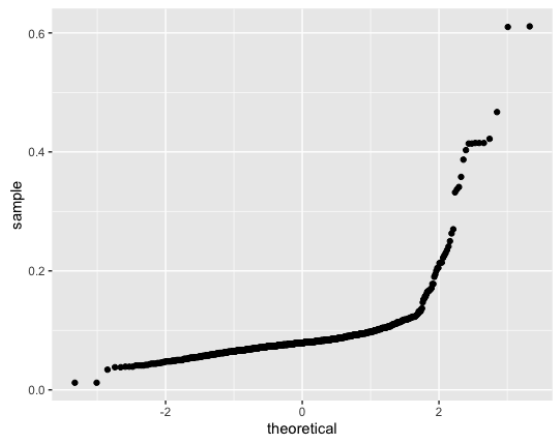
Volatile Acidity



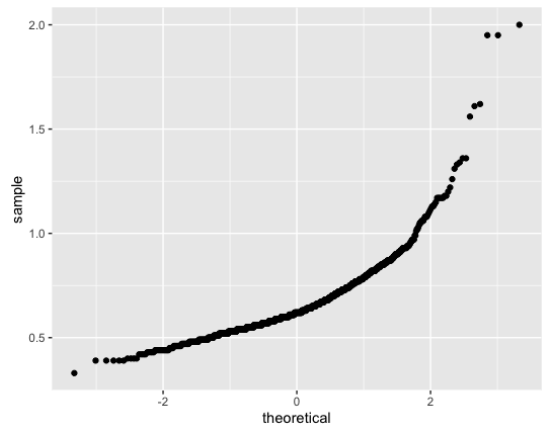
Citric Acid



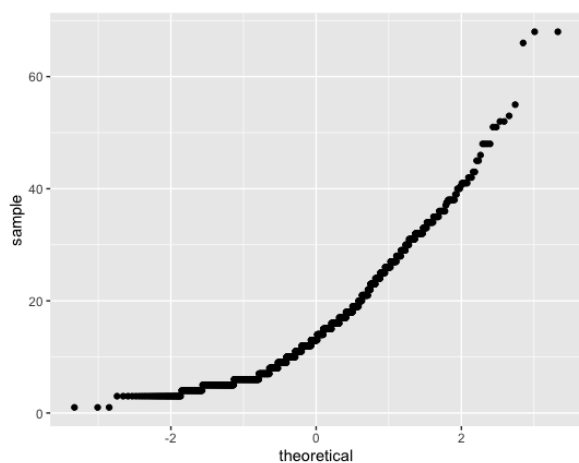
Residual Sugars



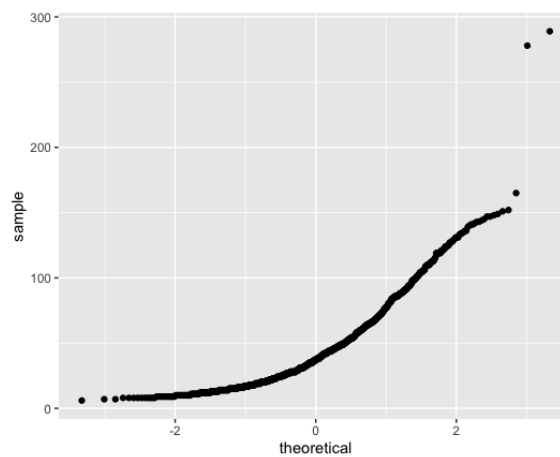
Chlorides



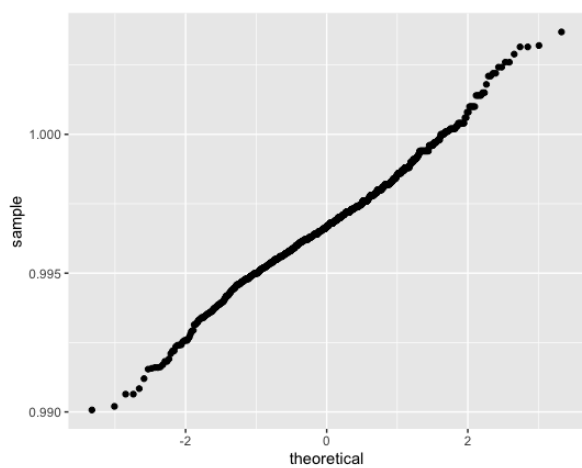
Sulphates



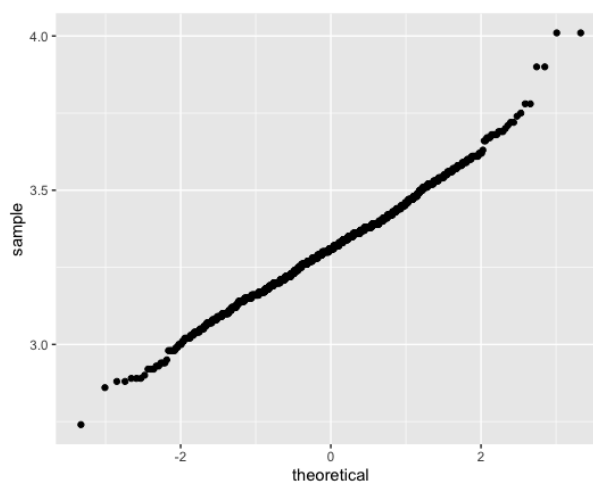
Free Sulfur Dioxide



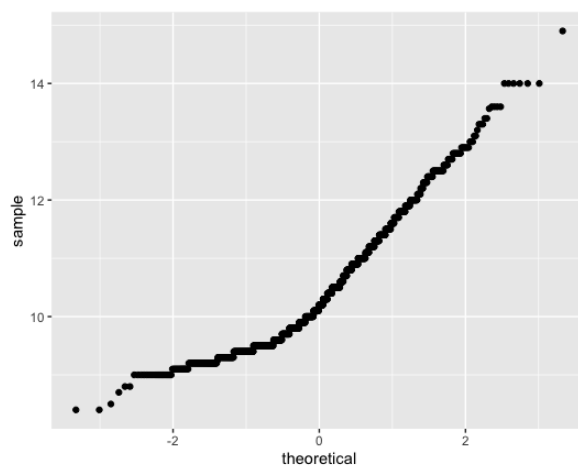
Total Sulfur Dioxide



Density



pH



Alcohol