

Sulphur Dioxide is used in wine (and other drinks) as a preservative to inhibit bacterial and fungal growth. Although not present in concentrations that will affect the general populace, the level of sulphur dioxide can affect sensitive individuals

 **Determining the SO2 concentration**

The SO2 content is determined via the following redox titration using starch as indicator:

SO2 (aq) + I2(aq) + 2H2O (l) 🡪 4H+ (aq) + SO42- (aq) + 2I- (aq)

If a standard iodine solution is added to a sample of wine, the iodine will react with the SO2.

When all of the SO2 has reacted, the iodine will react with the starch to give a blue-black colour. This is the end-point.

The concentration of SO2 can be calculated since 1 mole of iodine reacts with 1 mole of SO2.

You will analyse for 2 types of SO2: (A) Free SO2 (B) Total SO2 (free + combined)

**(A) Free SO2**

1. Pipette 25cm3 of wine/cider into a 250cm3 conical flask.
2. Add 5cm3 of 2 moll-1 sulphuric acid.
3. Add 2cm3 of starch solution (1%)
4. Titrate the solution with 0.001moll-1 iodine solution. The end point is the appearance of the blue-black colour which persists for ~ 2mins.
5. Repeat until concordant results are obtained.
6. Use your results to calculate the number of moles of SO2 present in 25cm3 of wine/cider. Convert this into ppm so that you can compare your results to your research.

 **(B) Total SO2 (free and combined)**

1. Add 25cm3 of 1 moll-1 NaOH into a 250cm3 conical flask using a measuring cylinder.

2. Pipette 25cm3 of wine/cider into the flask.

3. Shake the flask and let it stand for ~15minutes.

4. Add 10cm3 of 2 moll-1 sulphuric acid and 2cm3 of starch.

5. Titrate with 0.005 moll-1iodine as before.

6. Repeat until concordant results are obtained.

7. Use your results to calculate the number of moles of SO2 present in 25cm3 of wine/cider. Convert this into ppm so that you can compare your results to your research.



***Tips***

*You may find some trouble seeing the end point. If so, try using a more concentrated starch solution to give a darker final colour.*

*It also helps to have a reference flask/beaker next to the sample your iodine is running into, containing a sample of your wine/cider with acid and starch.*

*Converting to ppm*

*1mg per l = 1ppm*