

# Oxygen Virtual Lab Expectations and Grading (**Due Nov 8, 2021**)

Chem 111000-2: Section-33

November 1, 2021

## 1 General Remarks

This can be handwritten or typed, though typed is easier to read/grade. Or, some portions can be handwritten and some can be typed. Though, you may run out of space if you try and hand write it. If it is handwritten, make sure that it is legible and the scan is readable. Note this assignment is due Monday **Nov 8, 2021** at 5:30 pm.

## 2 Pre-Lab Questions (20 points)

For question 1, only need the top 4 components in air to receive full credit. For freezing and boiling points, report values in Kelvin.

## 3 Data and Calculation (40 points)

Follow the lab manual for instructions on how to calculate % O<sub>2</sub>. You need to report  $V$ ,  $V_{sw}$ ,  $V_{air}$ ,  $V_{O_2}$ , and %O<sub>2</sub> for each trial. There should be 2 average values reported as well,  $V$  and % O<sub>2</sub>. Use tables to summarize values where possible (points will be taken off otherwise). Be mindful of significant figures and units. You need a sample calculation for each calculation to receive full credit. Note: if you include calculations for each value you compute I will take points off as it clutters the document. So please, only **include 1 sample calculation** per type of calculation. Sample calculations is also where you show what the general formula is. You do not need to show a sample calculation of the average or stdev, but include the formula you use. This section is worth 30 points.

Use the given equation to calculate the percentage error for the average %O<sub>2</sub> you compute in the previous section. There should only be 1 equation and one value reported. Note that % error cannot have less than 1 significant figure! This section is worth 10 points.

In general, points will be taken off for wrong significant figures and units.

## 4 Discussion (30 points)

Each question is worth 10 points.

For question 1, summarize the results and compare to the expected value, and propose a better method to measure  $O_2$  in the air. The second part can be brief, but should be more thoroughly explained in the 'After-Lab Assignment, critical thinking'.

For question 2, you must use numerical values to support your response. You do not need to worry too much about significant figures, but do be mindful of units.

For question 3, this should be fairly familiar to most people, but you must discuss where errors can be introduced and cause deviations from the expected value. For the errors you discuss, you need to indicate how it affects the final value. Note, that you should not just discuss 1 error, but should discuss at least 2 significant sources of errors. This is the time to think critically about the experiment.

## 5 After Laboratory Assignment (10 points)

You only need to suggest 1 alternative approach to measure the oxygen content in the air. So long as you explain what the method is, and give a very brief outline of the steps taken, you will receive full credit. Only mentioning the technique/method will yield only a few points. Excessively detailed responses will lose points as well (do not list exact experimental steps).