Internal Assessment: Chemistry

Investigating the relationship between the amount of MnO_2 catalyst and the rate of reaction in the decomposition of H_2O_2.

May 8, 2025

Word count: 123

1 Preliminary Research Plan

Materials:

- Water for dilution
- $H_2O_2(l)$, will be diluted to 3%
- $MnO_2(s)$ powder, about 2g needed

Apparatus:

- Addition funnel
- Two- or multi-neck flask
- Clamp and stand
- Pressure sensor with tubing
- Graduated pipette and beakers for H_2O_2
- Thermometer to ensure constant initial temperature

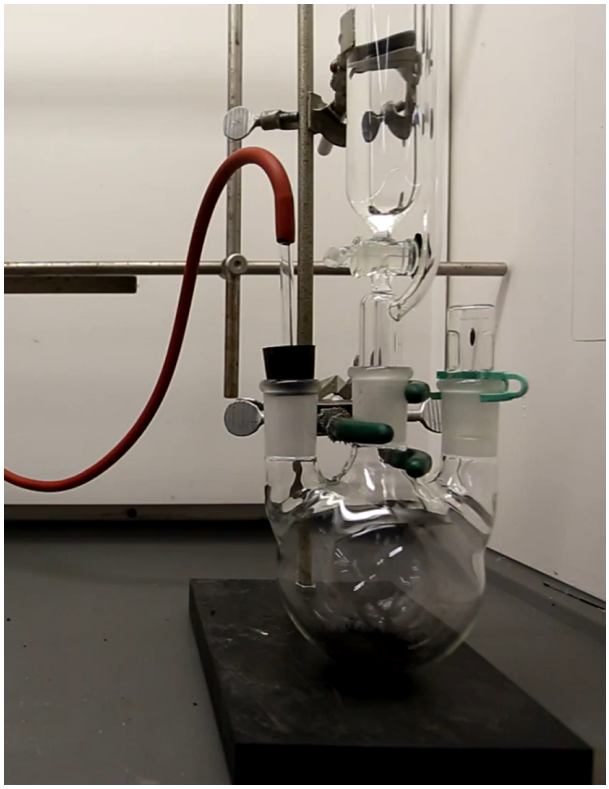
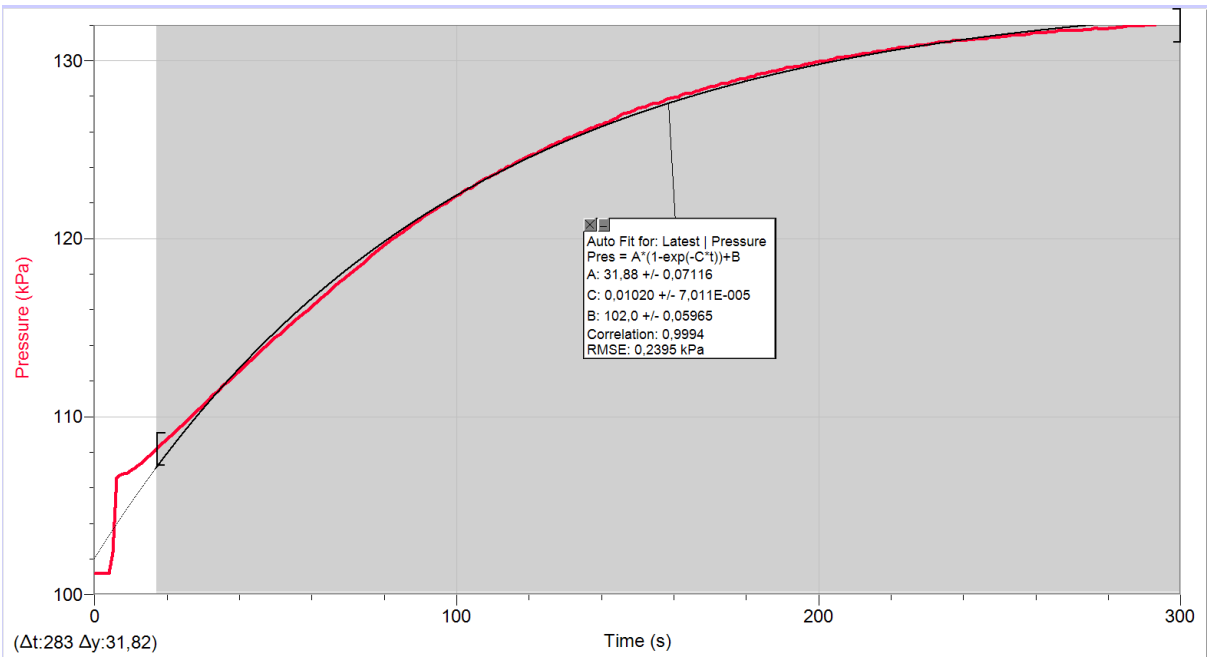
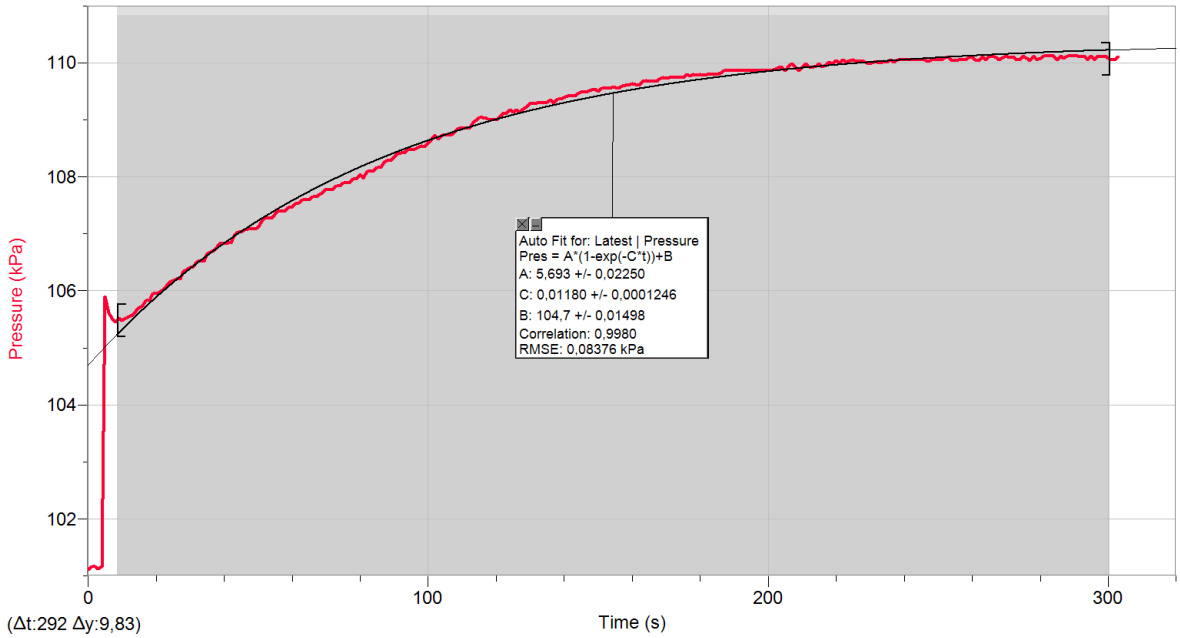


Figure 1: Example setup

This image is captured from the video *How to make an Oxygen Generator (MnO2/H2O2 Method)* uploaded to YouTube by NileRed, https://youtu.be/eI-HMUCEJsI.

My apparatus will be very similar to this; the only difference is that my rubber hosing will be connected to a pressure sensor. In every trial, after checking that the initial temperature and pressure are constant, I precisely measure the amount of MnO_2 to add to the flask. Then I add some constant volume of H_2O_2 through the addition funnel into the flask and close the funnel so air doesn't escape. I will record the change in pressure over time using Logger Pro.





I see that the graph is approximately an inverse exponent function. I shall use the coefficient C as the "rate of reaction" variable.