Boyle’s Law Experiment Essay, Research Paper

Introduction This group experiment was to investigate Boyle´s Law. It was named Boyle´s Law, after Robert Boyle, who made the discovery. The experiment involved compressing a certain amount of air molecules into a smaller space. The way to do this is to trap the air in between the top end of a glass tube and a very thick layer of oil. Below, is a picture of how we had to set out the apparatus. Apparatus Volume scale

Air pump

Glass tube

Pressure gauge

Oil Method and Prediction Using the pump, connected to the device, we pumped air in, through to the glass tube. But when it reached the oil, it couldn´t go any further – the oil is airtight. This then decreased the air volume above the oil, which we predicted would increase the pressure. The pressure was measured on the gauge, and we also predicted that if we halved the air volume, the pressure of the air would double. This prediction was correct. We realised that the pressure would increase as the volume decreased because the air molecules hitting the side of the glass tube would have less space to do so, which means that they would be colliding into the sides more often, which would increase the pressure on the glass tube. Results and Observations As we pumped more and more air into the glass tube, the level of oil was raised, because it was forced upwards. As I explained earlier, this decreased the volume of the area at the top of the tube and when we let air out of the device, the oil level dropped back down. This did the opposite to letting in air; it actually increased the volume of the gap. Here are the results that we got from doing this experiment: Pressure (x 105 N/m2)Volume (Cm2)

6053.5

7039.8

7938

8534

9031

10527

11025

12023

14019.5

15019

16017

18015

Conclusion and Evaluation My prediction about the volume decreasing and the pressure increasing was accurate. All of the volume results follow the pattern that we expected – they all decrease. Surprisingly, there are no confusing results – they all follow the pattern of the volume increasing as the pressure decreases. You can easily see this pattern. It was a fair experiment because only one person read off each of the results and we made sure that the vacuum pump tube was secured tightly on to the device. If we ever investigated Boyle´s Law again, I would make sure that when someone read of the results, they double – checked, and we could possibly do the experiment more than once. If we did this, we would be able to get an average result.