SCH3U Boyle's Law Worksheet

1. State the pressure-volume law both in words and in the form of an equation.

2.To compress nitrogen at 1 atm from 750 mL to 500 mL, what must the new pressure be if the temperature is kept constant? 1.5 atm

3.If oxygen at 128 kPa is allowed to expand at constant temperature until its pressure is 101.3 kPa, how much larger will the volume become? 1.26

4.A sample of nitrogen at 101.3 kPa with a volume of 100 mL is carefully compressed at constant temperature in successive changes in pressure, equaling 5 kPa at a time, until the final pressure is 133.3 kPa. Calculate each new volume and prepare a plot of P versus V, showing P on the horizontal axis.

5.A sample of nitrogen at 20°C was compressed from 300 mL to 0.360 mL and its new pressure was found to be 400.0 Pa. What was the original pressure in kPa? 4.8×10^{-4}

6.The pressure on 6.0 L of a gas is 200 kPa. What will be the volume if the pressure is doubled, keeping the temperature constant? 3L

7.What would be the new volume if the pressure on 600 mL is increased from 90 kPa to 150 kPa? 360 mL

8.A student collects 25 mL of gas at 96 kPa. What volume would this gas occupy at 101.325 kPa. There is no change in temperature or mass. 23.68 mL

9.A gas measuring 525 mL is collected at 104.66 kPa. What volume does this gas occupy at 99.33 kPa? 553.17 mL

10. A mass of gas occupies 1 L at 1 atm. At what pressure does this gas occupy

a) 2 litres, 0.5 atm

b) 0.5 litres? 2 atm

11.From the data in the following table calculate the missing quantity (assuming constant temperature).

a) V1 = 22.4 L; P1= 1 atm; P2 = ? atm; V2 = 2.8 L 8 atm

b) V1 = 60 mL; P1 = ? kPa; P2 = 101.3 kPa; V2 = 16 mL 27 kPa

c) V1 = ? m3 ; P1 = 40 Pa; P2 = 100 kPa; V2 = 1.0 L 2500 L= 2.5 x 109 m3

d) V1 = 2.50 L; P1 = 7.5 atm; P2 = ? atm; V2 = 100 mL 187.5 atm