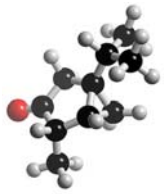
AS.CHEM1.2.004

THE IDEAL GAS EQUATION



Name …… Form ……

1) Convert the following into SI units.

a) 200ºC b) 98 kPa c) 50 cm^3 d) -50ºC e) 0.1 MPa f) 3.2 dm^3

2) Calculate the volume that 0.400 moles of an ideal gas occupies at 100ºC and a pressure of 1000 kPa.

3) How many moles of gas occupy 19400 cm^3 at 27ºC and 1 atm pressure?

4) Calculate the pressure that 0.05 moles of gas, which occupies a volume of 200 cm^3, exerts at a temperature of 50 K.

5) 0.140 moles of a gas has a volume of 2.00 dm^3 at a pressure of 90 kPa. Calculate the temperature of the gas.

6) At 273 K and 101000 Pa, 6.319 g of a gas occupies 2.00 dm^3. Calculate the relative molecular mass of the gas.

7) Calculate the relative molecular mass of a gas which has a density of 2.615 g dm^{-3} at 298 K and 101 kPa.

8) A certain mass of an ideal gas is in a sealed vessel of volume 3.25 dm^3. At a temperature of 25ºC it exerts a pressure of 101 kPa. What pressure will it exert at 100ºC?

9) An ideal gas occupies a volume of 2.75 dm^3 at 290K and 8.7 x 10^4 Pa. At what temperature will it occupy 3.95 dm^3 at 1.01 x 10^5 Pa?

10) Find the equation to calculate the root mean square velocity of gas particles. Once you have that equation, use it to calculate the root mean square velocity for nitrogen molecules at 298 K and 100 kPa.