Exercise 1.410 – The ideal gas equation

Q1410-01 What volume is needed to store 50 moles of an ideal gas at 15 atmospheres and 25 ºC?

Q1410-02 What pressure will be exerted by 200 moles of hydrogen gas in a 7.5 dm^3 cylinder at 20ºC?

Q1410-03 The temperature in Kelvin of 2 dm^3 of an ideal gas is doubled and its pressure is increased by a factor of 4. Calculate the final volume of the gas.

Q1410-04 Calculate the volume occupied by 0.01 moles of hydrogen gas at 20ºC and atmospheric pressure.

Q1410-05 How many moles of gas are present in a gas volume of 24dm^3 at 100ºC and atmospheric pressure?

Q1410-06 For which set of conditions does a fixed mass of an ideal gas have the greatest volume?

	Temperature	Pressure
A	low	low
B	low	high
C	high	high
D	high	low

Q1410-07 A 0.450g sample of gaseous aluminium chloride occupies a volume of 51.2 cm^3 at 100ºC and 102 kPa. Calculate its relative molecular mass.

Q1410-08 Calculate the number of moles of helium in a weather balloon measuring 200m3 at 5ºC and 80kPa pressure.

Q1410-09 The molar mass of an unknown gas is to be determined by weighing a sample. As well as its mass which of the following must be known.

I	Pressure
II	Temperature
III	Volume

A: I only; B: II only; C: I and II only; D: I, II, and III

Q1410-10 In an experiment to determine the relative molecular mass of an unknown hydrocarbon, 0.15g of the liquid hydrocarbon was injected through a rubber septum into a gas syringe. The gas syringe was placed in an oven at 120ºC and left to reach equilibrium. The final volume occupied by the vapour in the syringe was measured and found to be 67.4 cm^3. Calculate the relative molecular mass of the hydrocarbon, if the atmospheric pressure was 101 kPa on that day.