

PENANG SANGAM HIGH SCHOOL
DEPARTMENT OF BIOLOGICAL AND CHEMICAL SCIENCE
CHEMISTRY- YEAR 13

WORKSHEET 2

INVESTIGATING MATTER

SECTION A

MULTIPLE CHOICE

Refer to the following experimental observations to answer Questions 1 and 2.

In an experiment, excess hydrochloric acid was reacted with 0.071 g of an unknown metal. The hydrogen gas that was collected over water at 25°C had a volume of 0.100 dm^3 at a total pressure of 100.0 kPa .

[*SVP of water at $25^{\circ}\text{C} = 3.00\text{ kPa}$*] and [$R = 8.314\text{ JK}^{-1}\text{ mol}^{-1}$]

1. The vapour pressure of hydrogen gas in the sample is:

- A. 97.0 kPa
- B. 100.0 kPa
- C. 101.1 kPa
- D. 103.0 kPa

2. The number of moles of hydrogen gas collected in the above experiment is:

- A. $4.00 \times 10^{-3}\text{ kPa}$
- B. $4.92 \times 10^{-3}\text{ kPa}$
- C. $3.92 \times 10^{-3}\text{ kPa}$
- D. $3.92 \times 10^{+3}\text{ kPa}$

SECTION B**SHORT ANSWER QUESTIONS**

1. A gas collected over water at 29°C and 111.3 kPa was found to occupy 25.4 ml . Calculate the volume the dry gas would occupy at *STP*.

[*SVP of water at $29^{\circ}\text{C} = 12.2\text{ kPa}$*]

2. The equation for the Haber Process is given below.



Calculate the volume of the NH_3 produced if 25 L of N_2 and 40 L of H_2 is present in the reaction mixture at constant Temperature and pressure.

3. Justify the following statement:

a) An increase in electronegativity leads to an increase in ionization energy.
