Questions from the Homework

Quiz - Wed

Test back → Tues

① mol = ?

5.40×10²¹ atoms

$$5.40 \times 10^{21} \text{ atoms} \times \frac{1 \text{ mol}}{6.02 \times 10^{23} \text{ atoms}} = \frac{5.40 \times 10^{21}}{6.02 \times 10^{23}} \text{ mol}$$

$$= 0.00897 \text{ mol}$$

$$= 8.97 \times 10^{-3} \text{ mol}$$

How many molecules are in 2.456 moles of dihydrogen monoxide?

molecules = ?

mol = 2.456 mol

$1 \text{ mol} = 6.02 \times 10^{23} \text{ molecules}$

$2.456 \text{ mol} \times \dfrac{6.02 \times 10^{23} \text{ molecules}}{1 \text{ mol}} = 2.456 \times 6.02 \times 10^{23} \text{ molecules}$

$= 1.479 \times 10^{24} \text{ molecules}$

How many moles are in 1.5 billion atoms of carbon?

mol = ?

atoms = 1.5 b

$$1.5 b \text{ atoms} \times \frac{1 \text{ mol}}{6.02 \times 10^{23} \text{ atoms}} = \frac{1,500,000,000}{6.02 \times 10^{23}} \text{ mol}$$

$$= 2.5 \times 10^{-15} \text{ mol}$$

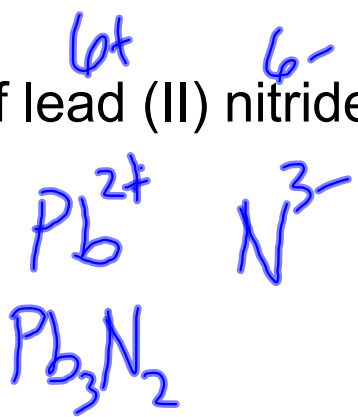What is the molar mass of carbon tetrafluoride?

① CF_4

$$C \rightarrow 1 \times 12.01 \overset{③}{=} 12.01$$
$$F \rightarrow 4 \times 19.00 = 76.00$$

②

④ 88.01 g/mol

How many grams are in 0.567mol of lead (II) nitride?

Pb^{6+} N^{6-}

Pb^{2+} N^{3-}

$m = ?$

$n = 0.567 mol$

Pb_3N_2

$Pb = 3 \times 207.2 = 621.6$

$N = 2 \times 14.00 = 28.00$

$\underline{649.6 g/mol}$

$0.567 mol \times \dfrac{649.6 g}{1 mol}$

$= 368 g$

What is the molar mass of an

Unknown substance if 0.500 mol

has a mass of 156g?

$MM = ?$

$m = 156g$

$n = 0.500 mol$

$MM = \dfrac{156g}{0.500 mol} = 312 g/mol$

How many moles are in a sample of copper (II) sulfate that has a mass of 4.5 kg?

Cu^{2+} SO_4^{2-}

$CuSO_4$

$n = ?$

$m = 4.5 kg$

$= 4500 g$

$Cu \rightarrow 1 \times 63.55$

$S \rightarrow 1 \times 32.06$

$O \rightarrow 4 \times 16.00$

$4500 g \times \dfrac{1 mol}{159.61 g} = \boxed{28 mol}$

$\overline{159.61 g/mol}$

A sample of hydrogen gas at STP has a volume of
45.5L. How many moles of hydrogen are in this sample?

$$1 \, mol = 22.4 \, L$$

$$\frac{45.5 \, L}{22.4 \, L/mol} = 2.03 \, mol$$

$$45.5 \, \cancel{L} \times \frac{1 \, mol}{22.4 \, \cancel{L}} = \frac{45.5}{22.4} \, mol = 2.03 \, mol$$