HW 5 ✓ QUIZ 1 ✓

# HOMEWORK ✓ PART ✓

A. GLASS = 48.462g 4 mL ANTIFREEZE mass + 4mL = 54.513g

D OF ANTIFREEZE => V = 4 mL m = 54.513 − 48.462 = 6.051g

$D = \frac{m}{V} = \frac{6.051\,g}{4\,mL} = 1.513\,g/mL$

Q. 5.7 mg Au into area of 44.6 $cm^2$ WHAT IS THICKNESS OF FILM? $D_{GOLD} = 19.3\,g/cm^3$

$V = \frac{M}{D}$ 19.3 g/cm³

$(5.7\,mg)\left(\frac{1\,g}{1000\,mg}\right) = .0057g$

SEE ATTACHED

$D = M/V$

AREA = $(6.6780\,cm)^2$ HEIGHT?

$\left(\frac{19.3\,g}{cm^3}\right) = \frac{.0057\,g}{(44.6\,cm^2)(x\,cm)}$

$V_{OL} = \frac{M}{D} = \frac{.0057g}{19.3\,g/cm^3} = 2.95 \times 10^{-4}\,cm^3$

$(19.3\,g/cm^3)(x\,cm) = \frac{.0057\,g}{44.6\,cm^2}$

$x\,cm = \left(\frac{.0057g}{44.6\,cm^2}\right)\left(\frac{1}{19.3\,g/cm^3}\right)\frac{1}{1\,cm}$

$= 6.62 \times 10^{-6}$ cm THICK

GOOD ANSWER BUT METHOD TOO

b. 5.7 mg Au has area of 44.6 cm². What is thickness of the leaf? $\delta_{Au} = 19.3\ g/cm^3$

$$5.7\ mg \times \frac{1\ g}{1000\ mg} = .0057\ g\ Au$$

$$d = \frac{m}{V} \qquad V = \frac{m}{d} = \frac{.0057\ g}{19.3\ g/cm^3} = 2.95 \times 10^{-4}\ cm$$

$V = 2.95 \times 10^{-4}\ cm^3$ Area $= 44.6\ cm^2$

$$\text{Height} = \frac{V}{A} = \frac{2.95 \times 10^{-4}\ cm^3}{44.6\ cm^2}$$

$$\text{Height} = 6.6 \times 10^{-6}\ cm$$

C. 30X .8mX.8mX 1.2 mm @ 3.2 Kg POLYETHYLENE = ? g/cm³

$(.768\ m^3)\left(\frac{1000000\ cm^3}{m^3}\right) = 768000\ cm^3$

.80m x .80cm x 120 cm = 768000 cm³

$(3.2\ Kg)\left(\frac{1000g}{Kg}\right) = 3200g$

$\delta = M/V = \frac{3200g}{768000\ cm^3} = 4.167 \times 10^{-3}\ g/cm^3$

D. $\delta = 12.8\ Kg/m^3$ VOL = 2 FT³ MASS = ? g

$= \left(12.8\frac{Kg}{m^3}\right)\left(\frac{1000g}{Kg}\right)\left(\frac{1\ m^3}{1,000,000\ cm^3}\right) = .0128\frac{g}{cm^3} = \delta$

$V = (2\ Ft^3)\left(\frac{1728\ in^3}{Ft^3}\right)\left(\frac{16.387\ cm^3}{in^3}\right) = 56633.47\ cm^3$

$\delta = M/V \qquad M = V \cdot \delta = (56633.47\ cm^3)\left(.0128\frac{g}{cm^3}\right)$

$= 724.91\ g$

E. WHICH WEIGHS MORE 100 LBS POTATOES, 15 GAL $H_2O$ OR 3 L $H_2$ ? $\rho_{H_2O} = 1$ g/mL $\rho_{H_2} = 13.534$ g/mL

A B

I. $(100 \text{ LBS})\left(\frac{453.6 \text{ g}}{\text{LB}}\right) = 45360 \text{ g POTATOES}$

II. $(15 \text{ gal } H_2O)\left(\frac{3.785 \text{ L}}{\text{gal}}\right)\left(\frac{1000 \text{ mL}}{\text{L}}\right)\left(\frac{1 \text{ g}}{\text{mL}}\right) = 56775 \text{ g } H_2O$

III. $(3 \text{ L } H_2)\left(\frac{1000 \text{ mL}}{\text{L}}\right)\left(\frac{13.534 \text{ g}}{\text{mL}}\right) = 40602 \text{ g } H_2$

∴ B, 15 GAL $H_2O$ HAS GREATEST MASS AND WILL BE HARDEST TO THROW INTO PIECE OF BED

e) Which of the following would most difficult to lift into the back of a pickup truck? (I) a 100 lb bag of potatoes (II) a 15 gallon plastic bottle filled with water or (III) a 3.0 L flask filled with mercury (density of water = 1g/ml; density of Hg = 13.534 g/ml)

Part 2: Parts of the atom:

...One thing to remember, if an atom has no charge then the number of protons will equal the number of electrons.

1) How many protons are there in carbon 12?

6

2) How many neutrons are there in sodium 23?

23 - 11 = 12 NEUTRONS

3) If an oxygen atom is neutral, how many electrons does it have?

8

4) How many protons are there in uranium 235?

92

5) How many neutrons are there in uranium 235?

235 - 92 = 143

6) What is the average atomic mass of Mercury?

200.59 AMU

Part 3: Average Atomic Mass:

1) A new element Cornium (Cn) has been discovered with two isotopes, Sweet Cornium and Feed Cornium. $^{sweet}Cn$ has a mass of 0.82 amu and $^{feed}Cn$ has a mass of 0.78 amu. If the relative abundance of sweet Cornium is 35.8% and the relative abundance of feed Cornium is 64.2%, determine the average atomic mass for Cornium.

(.82 AMU)(.358) + (.78 AMU)(.642) = .79432 AMU

= .79 AMU

2) Close on the heels of Corniums great discovery was the discovery of Beanium (Bn). Beanium has 3 isotopes, $^{\text{pinto}}$Bn, $^{\text{kidney}}$Bn and $^{\text{BlackEyed}}$Bn. The masses of each are 1.25 amu, 1.36 amu and 0.98 amu respectively. If each has a relative abundance of 33.3% what is the average atomic mass for Beanium?

(1.25 amu)(.333) + (1.36 amu)(.333) + (.98 amu)(.333)

= 1.19547 amu

= 1.20 amu

3) Carbon 12 occurs in nature 98.89% of the time, and carbon 13 occurs 1.11% of the time. What is the average atomic mass of carbon?

$^{12}C$ = 12.0000 amu $^{13}C$ = 13.0034 amu

(12.0000 amu)(.9889) + (13.0034 amu)(.0111)

= 12.01 amu

4) Lithium 6 has a relative abundance of 7.42% and lithium 7 a relative abundance of 92.58%. What is the average atomic mass of lithium?

$^{6}L$ = 6.0151 amu $^{7}L$ = 7.0160 amu

(6.0151 amu)(.0742) + (7.0160 amu)(.9258)

= 6.94 amu

5) The fractional abundance of nitrogen 14 is 99.63% and for nitrogen 15 is 0.37%. What is the average atomic mass?

$^{14}N$ = 14.0031 amu $^{15}N$ = 15.0001 amu

(14.0031 amu)(.9963) + (15.0001 amu)(.0037)

= 14.01 amu