

### Multiple Choice

- 1) How many silver (Ag) atoms are in 14.5 grams of it?  
A)  $6.9 \times 10^{22}$     B)  $5.5 \times 10^{22}$     C)  $7.2 \times 10^{22}$      D)  $8.1 \times 10^{22}$
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- 2) Calculate the mass (in grams) in 3.0 moles of  $\text{CF}_2\text{Cl}_2$  ?  
A) 313.4     B) 362.7    C) 319.5    D) 333.3
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- 3) How many sulfur atoms (S) are in 25.6 grams of  $\text{Al}_2(\text{S}_2\text{O}_3)_3$ ?  
 A)  $2.37 \times 10^{23}$     B)  $2.12 \times 10^{23}$     C)  $3.55 \times 10^{23}$     D)  $3.14 \times 10^{23}$
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- 4) Calculate the weight percentage wt.% of phosphorous "P" in phosphate  $\text{Ca}_{10}\text{F}_2(\text{PO}_4)_6$  ?  
A) 20.6    B) 15.7    C) 17.2     D) 18.45
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- 5) 5.0 grams of an organic compound was burned completely in oxygen to produce 7.3 grams of  $\text{CO}_2$ . What is the weight percentage wt.% of carbon in this organic compound?  
A) 54.3%     B) 39.82%    C) 32.6%    D) 49.7%
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- 6) Determine the empirical formula of the compound with the following composition by mass: 40.92% C, 4.58% H and 54.50% O.  
A)  $\text{CH}_2\text{O}$     B)  $\text{C}_3\text{H}_3\text{O}_2$     C)  $\text{C}_2\text{H}_6\text{O}$      D)  $\text{C}_3\text{H}_4\text{O}_3$
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- 7) 2.75 moles of  $\text{NH}_3$  were obtained by reacting 6.0 moles of  $\text{H}_2$  with 4.0 moles of  $\text{N}_2$ .  
$$3\text{H}_2(\text{g}) + \text{N}_2(\text{g}) \rightarrow 2\text{NH}_3(\text{g})$$
  
What is the percent yield of  $\text{NH}_3$ ?  
A) 81.25%    B) 70.25%     C) 68.75%    D) 75.75%
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- 8) What is the molality of a 15% by mass  $\text{MgCl}_2$  in  $\text{H}_2\text{O}$ ?  
 A) 1.85 m    B) 1.59 m    C) 1.35 m    D) 1.18 m
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- 9) The volume in ml of 0.251 M KI solution that contains 13.5 g of KI is:  
A) 382     B) 324    C) 345    D) 363
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- 10) The root-mean-square speed (rms)"u" (in  $\text{m}\cdot\text{s}^{-1}$  unit) of  $\text{N}_2$  molecules gas at  $25^\circ\text{C}$  is:  
 A) 515    B) 375    C) 425    D) 428
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- 11) At what Kelvin temperature will a gas sample occupy 0.850 L at 1.0 atm pressure if it occupies 0.40 L at 305 K and 1.0 atm pressure?  
A) 455    B) 680    C) 483     D) 648

12) What is the pressure (in atm. unit) of  $12 \times 10^3$  moles of methane gas stored at  $48^\circ\text{C}$  in a 3000.0 L tank?

- A) 112.8      B) 97.2      C) 105.4      D) 110.5
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13) If equal masses of  $\text{N}_2(\text{g})$  and  $\text{O}_2(\text{g})$  are in separate containers having the same volume and temperature, which one of the following statements is true?

- A) The pressure in the  $\text{N}_2$  gas container is greater than that in the  $\text{O}_2$  gas container.  
B) The pressure in the  $\text{O}_2$  gas container is greater than that in the  $\text{N}_2$  gas container.  
C) The average kinetic energy of  $\text{N}_2$  molecules is greater than that of  $\text{O}_2$  molecules.  
D) The average kinetic energy of  $\text{O}_2$  molecules is greater than that of  $\text{N}_2$  molecules.
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14) What is the molar mass (in  $\text{g}\cdot\text{mol}^{-1}$  unit) of a gas having a density of 1.57 g/L at  $25^\circ\text{C}$  and 1.2 atm?

- A) 28      B) 71      C) 44      D) 32
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15) What is the partial pressure of 0.6 mol  $\text{CO}_2$  (in atm) that mixed with 0.75 mol  $\text{N}_2$  and 0.525 mol  $\text{O}_2$  if the total pressure of the three gases mixture is 1.5 atm?

- A) 0.68      B) 0.52      C) 0.60      D) 0.48
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