

D

Multiple Choice

1) The mass (in g) of glucose " $C_6H_{12}O_6$ " that contains 4.5×10^{23} hydrogen "H" atoms is:

- ☐ A) 12.55 B) 13.44 C) 10.33 D) 11.22
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2) The number of moles of iron oxide " Fe_2O_3 " that contains 39.1 g of iron "Fe" is:

- ☐ A) 0.37 B) 0.35 C) 0.39 D) 0.33
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3) The molar mass (in g/mol) of the compound that has four potassium "K" atoms per molecule and contains 42.45% by mass of potassium is:

- ☐ A) 349.6 B) 337.5 C) 368.4 D) 352.8
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4) The mass (in kg) of copper "Cu" present in 250.0 kg of the malakite mineral " $Cu_2CO_3(OH)_2$ " is:

- ☐ A) 143.7 B) 144.9 C) 141.1 D) 142.3
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5) An inorganic compound is found to contain: **35.61%** by mass rubidium "Rb", **40.64%** by mass platinum "Pt" and **23.75%** by mass fluorine "F". The empirical formula of this compound is:

- ☐ A) Rb_3PtF_6 B) Rb_3PtF_5 C) Rb_2PtF_6 D) Rb_2PtF_5
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6) The mass (in g) of potassium iodide "KI" that is present in 750.0 mL of 1.2 M aqueous potassium iodide solution is:

- ☐ A) 147.6 B) 149.4 C) 143.8 D) 145.6
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7) Potassium benzoate " $KC_7H_5O_2$ " can be prepared by the action of potassium permanganate " $KMnO_4$ " on toluene " C_7H_8 " according to:



If 200.0 g of toluene are allowed to react with an excess of potassium permanganate and 260.0 g of potassium benzoate are obtained, the percentage yield of potassium benzoate is.

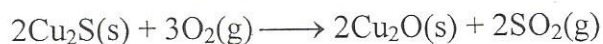
- ☐ A) 78.25% B) 85.48% C) 72.35% D) 74.76%
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8) An amount of a gas is introduced into an adjustable-volume gas vessel at a pressure of 1.8 atm, a temperature of $15^\circ C$ and a volume equals to 6.9 L. If the temperature of the gas is raised to $77^\circ C$ and its volume is increased to 7.2 L, assuming ideal behavior, the final pressure of the gas (in atm) will be:

- A) 2.1 B) 1.9 C) 2.5 D) 2.3
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D

- 9) Copper sulfide "CuS" reacts with oxygen "O₂" according to:



The volume (in L) of oxygen gas measured at 25°C and 1.0 atm, which is required to react with 125.0 g of Cu₂S is.

- ☐ A) 26.26 B) 25.25 C) 28.82 D) 27.72
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- 10) 9.32 g of a gas is sealed in a 5.0 L gas vessel at 25°C and 1.2 atm. Assuming ideal behavior, this gas is mostly likely:

- ☐ A) CO₂ B) F₂ C) O₂ D) NH₃
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- 11) A mixture of 0.7 mol O₂ gas, 1.0 mol of Ar gas and 1.1 mol N₂ is introduced into a gas cylinder causing a total pressure of 1.4 atm. Assuming ideal behavior, the partial pressure (in mmHg) of O₂ gas inside the cylinder is:

- ☐ A) 277 B) 283 C) 255 D) 266
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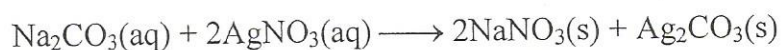
- 12) Arrange the following four pairs of gas mixtures according to the simplicity of separating each gas from the other by effusion (the most easily pair to be separated is to the right).

- 1) N₂ and CH₄.
- 2) Ne and He.
- 3) N₂ and CO.
- 4) Xe and O₂.

- ☐ A) 3 < 1 < 4 < 2 B) 3 < 4 < 2 < 1
C) 1 < 3 < 2 < 4 D) 4 < 3 < 1 < 2
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Answer in details the following problem:

Answer in details the following problem:
Aqueous solutions of sodium carbonate " Na_2CO_3 " and silver nitrate " AgNO_3 " react to give aqueous sodium nitrate " NaNO_3 " and solid silver carbonate " Ag_2CO_3 " according to:



A solution containing 50.0 g of sodium carbonate is mixed with a solution containing 50.0 g of silver nitrate. After the reaction is complete, the water of dissolution is carefully evaporated to dryness. Calculate the mass (in g) for any of the above mentioned chemical species which could be present in the resulting solid.

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