

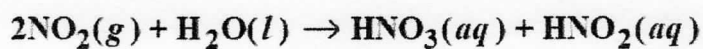
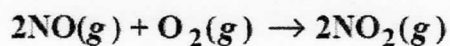
Enter your answer in the provided box.

Assume the atomic mass of element X is 22.99 amu. A 28.88-g sample of X combines with 100.35 g of another element Y to form a compound XY. Calculate the atomic mass of Y.

amu

Be sure to answer all parts.

Industrially, nitric acid is produced by the Ostwald process, as represented by the following equations:

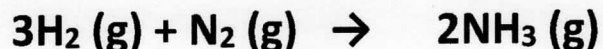


What mass of NH_3 (in grams) must be used to produce 3.97 tons of HNO_3 by the Ostwald process, assuming an 80.0 percent yield in each step (1 ton = 2000 lb; 1 lb = 453.6 g)? Enter your answer in scientific notation.

$\times 10^{\text{$ g NH_3

3.50 Calculate the mass in grams of iodine (I₂) that will react completely with 20.4g of aluminum (Al) to form aluminum iodide.

3.72 Ammonia is prepared by the reaction between hydrogen and nitrogen:

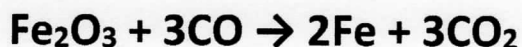


In a particular reaction, 6.0 mol of NH₃ were produced. How many moles of H₂ and how many moles of N₂ were consumed to produce this amount of NH₃?

3.48 The density of water is 1.00g/mL at 4 °C. How many water molecules are present in 15.78 mL of water at this temperature?

3.64 Ascorbic acid contains C, H, and O. In one combustion analysis, 5.24g of ascorbic acid yields 7.86g of CO₂ and 2.14g H₂O. Calculate the empirical formula and molecular formula of ascorbic acid given that its molar mass is about 176g/mol.

3.138 One of the reactions that occurs in a blast furnace, where iron ore is converted to cast iron, is:



Suppose that 1.64×10^3 kg of Fe is obtained from a 2.62×10^3 kg sample of Fe₂O₃. Assuming the reaction goes to completion, what is the percent purity of Fe₂O₃ in the original sample?

3.94 When heated, lithium (Li) reacts with nitrogen (N₂) to form lithium nitride. What is the theoretical yield of lithium nitride in grams when 12.3g of Li is heated with 33.6g of N₂? If the actual yield of lithium nitride is 5.89g, what is the percent yield of the reaction?

3.90 Given the reaction:

CaF₂ + H₂SO₄ → Calcium sulfate and hydrofluoric acid

Write a balanced equation. In one process, 6.00 kg of CaF₂ is treated with an excess of sulfuric acid and yields 2.86kg of hydrofluoric acid. Calculate the percent yield of hydrofluoric acid.

1. Fill in the correct formula for each compound on the line next to its name below:

Uranium (VI) fluoride _____

Magnesium hydroxide _____

Sodium carbonate _____

Potassium sulfite _____

Phosphoric Acid _____

2. Fill in the correct name for each compound on the line next to its formula below:

$\text{Fe}(\text{OH})_3$ _____

$\text{Ca}(\text{OCl})_2$ _____

NH_4Cl _____

$\text{K}_2\text{Cr}_2\text{O}_7$ _____

KH_2PO_4 _____

- 2.84 Fill in the correct formula for each compound on the line next to its name below:

Copper (I) cyanide _____

Strontium chlorite _____

Perbromic acid _____

Hydroiodic acid _____

Disodium ammonium phosphate _____

Potassium dihydrogen phosphate _____

Iodine heptafluoride _____

Tetraphosphorous decasulfide _____

Mercury (II) oxide _____

Cobalt (II) carbonate _____

Selenium hexafluoride _____

Nickel (II) nitrate hexahydrate _____

2.82. Fill in the correct name for each compound on the line next to its formula below:

KClO _____

Ag₂CO₃ _____

HNO₂ _____

KMnO₄ _____

CsClO₃ _____

KNH₄SO₄ _____

FeO _____

Fe₂O₃ _____

TiCl₄ _____

NaH _____

Li₃N _____

Na₂O _____

Na₂O₂ _____

2.96 What is wrong with the name given for each of the compounds below?

Ba Cl₂ Barium dichloride

Fe₂O₃ iron (II)oxide

CsNO₂ cesium nitrate

Mg(HCO₃)₂ magnesium (II) bicarbonate