

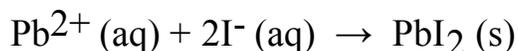
Chem101 Midterm Exam study questions

Los Angeles City College

Cervantes/Cai

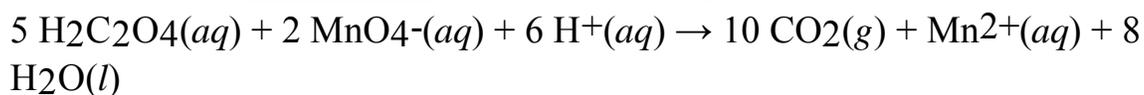
1) What is the molarity of a NaOH solution if 28.2 mL of a 0.355 M H₂SO₄ solution is required to neutralize a 25.0-mL sample of the NaOH solution?

2) Lead ions can be precipitated from aqueous solutions by the addition of aqueous iodide:

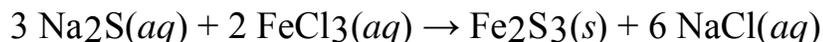


Lead iodide is virtually insoluble in water so that the reaction appears to go to completion. How many milliliters of 3.550 M HI(aq) must be added to a solution containing 0.700 mol of Pb(NO₃)₂(aq) to completely precipitate the lead?

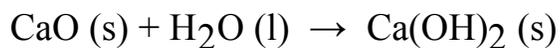
3) According to the balanced equation shown below, 4.00 moles of oxalic acid, H₂C₂O₄, reacts with _____ moles of permanganate, MnO₄⁻.



4) How many milliliters of 0.200 M FeCl₃ are needed to react with an excess of Na₂S to produce 1.38 g of Fe₂S₃ if the percent yield for the reaction is 65.0%?



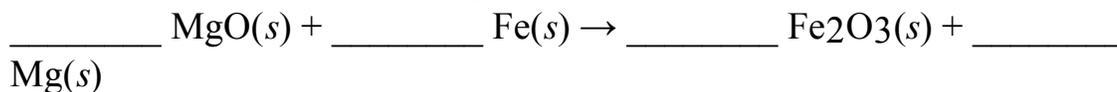
5) Calcium oxide reacts with water in a combination reaction to produce calcium hydroxide:



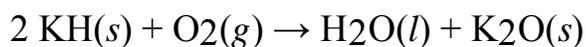
In a particular experiment, a 5.00-g sample of CaO is reacted with excess water and 6.11 g of Ca(OH)₂ is recovered. What is the percent yield in this experiment?

6) A student dissolved 4.00 g of Co(NO₃)₂ in enough water to make 100. mL of stock solution. He took 4.00 mL of the stock solution and then diluted it with water to give 275. mL of a final solution. How many grams of NO₃⁻ ion are there in the final solution?

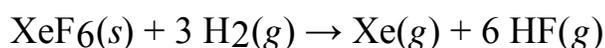
- 7) Balance the chemical equation given below, and determine the number of grams of MgO are needed to produce 10.0 g of Fe₂O₃ .



- 8) How many liters of O₂ gas at 25°C and 1.00 atm pressure are needed to react with 60.25 grams of potassium hydride according to the chemical equation shown below?



- 9) How many grams of XeF₆ are required to react with 0.579 L of hydrogen gas at 6.46 atm and 45°C in the reaction shown below?



- 10) What is the **total** volume of hydrogen gas and oxygen gas that can be produced from the thermal decomposition of 0.0425 grams of H₂O₂ at 700°C and 755 mm Hg according to the chemical equation shown below?



- 11) Methane and oxygen react to form carbon dioxide and water. What mass of water is formed if 0.80 g of methane reacts with 3.2 g of oxygen to produce 2.2 g of carbon dioxide?

- 12) Determine the empirical formula for a compound that is found to contain 10.15 mg P and 34.85 mg Cl.

- 13) A certain alcohol contains only three elements, carbon, hydrogen, and oxygen. Combustion of a 50.00 gram sample of the alcohol produced 95.50 grams of CO₂ and 58.70 grams of H₂O. What is the empirical formula of the alcohol? What is the name of the alcohol?

Answer Key

Testname: CHEM101 STUDY QUESTIONS

- 1) 0.801
- 2) 394 mL
- 3) 1.60
- 4) 102 mL
- 5) 92.5
- 6) 0.108 g
- 7) 7.57 g
- 8) 18.4 L
- 9) 11.7 g
- 10) 201 mL
- 11) 1.8 g
- 12) PCl_3
- 13) $\text{C}_2\text{H}_6\text{O}$ (or $\text{C}_2\text{H}_5\text{OH}$), ethanol