

Chapter 12 Practice Problems (limiting reactants)

1. Identify the limiting reactant when 1.22 g of O_2 reacts with 1.05 g of H_2 to produce water.
2. Identify the limiting reactant when 4.68 g of Fe reacts with 2.88 g of S to produce FeS.
3. Identify the limiting reactant when 5.87 g of $Mg(OH)_2$ reacts with 12.84 g of HCl to form $MgCl_2$ and water.
4. Identify the limiting reactant when 6.25 g of $AgNO_3$ reacts with 4.12 g of NaCl to form $NaNO_3$ and AgCl.
5. Identify the limiting reactant when 7.81 g of HCl reacts with 5.24 g of NaOH to produce NaCl and H_2O .
6. Identify the limiting reactant when 6.33 g of H_2SO_4 reacts with 5.92 g of NaOH to produce Na_2SO_4 and water.
7. Identify the limiting reactant when 43.25 g of CaC_2 reacts with 33.71 g of water to produce $Ca(OH)_2$ and C_2H_2 .
8. Identify the limiting reactant when 65.14 g of $CaCl_2$ reacts with 74.68 g of Na_2CO_3 to produce $CaCO_3$ and NaCl.
9. Identify the limiting reactant when 4.687 g of SF_4 reacts with 6.281 g of I_2O_5 to produce IF_5 and SO_2 .
10. If 4.1 g of Cr is heated with 9.3 g of Cl_2 , what mass $CrCl_3$ will be produced?
11. What mass of SO_2 is produced from the reaction between 31.5 g of S_8 and 8.65 g of O_2 ?
12. What mass of SO_3 is produced from the reaction of 12.4 g of SO_2 and 3.45 g of O_2 ?
13. What mass of H_2SO_4 is produced from the reaction of 6.58 g of SO_3 and 1.64 g of H_2O ?
14. What mass of CdS is produced if 8.47 g of cadmium reacts with 2.51 g of sulfur?
15. If 21.4 g of aluminum is reacted with 91.3 g of Fe_2O_3 , the products will be: Al_2O_3 and iron. What mass of iron will be produced?
16. If 41.6 g of N_2O_4 reacts with 20.8 g of N_2H_4 , the products will be nitrogen and water. What mass of water will be produced?

17. If 16.8 g of CO is mixed under high pressure with 1.78 g of H₂, what mass of methanol (CH₃OH) will be produced?
18. What mass of NaCl will be produced by the reaction of 58.7 g of NaI with 29.4 g of Cl₂ gas if the products are sodium chloride and I₂?
19. Determine the percent yield for the reaction between 3.74 g of Na and excess O₂ if 5.34 g of Na₂O₂ is recovered.
20. Determine the percent yield for the reaction between 6.92 g of K and 4.28 g of O₂ if 7.36 g of K₂O is produced.
21. Determine the percent yield for the reaction between 82.4 g of Rb and 11.6 g of O₂ if 39.7 g of Rb₂O is produced.
22. Determine the percent yield for the reaction between 46.1 g of Cs and 13.4 g of O₂ if 28.3 g of Cs₂O is produced.
23. Determine the percent yield for the reaction between 28.1 g of Sb₄O₆ and excess C if 17.3 g of Sb is recovered along with an unknown amount of CO.
24. Determine the percent yield for the reaction between 45.9 g of NaBr and excess chlorine gas to produce 12.8 g of NaCl and an unknown quantity of bromine gas.
25. Determine the percent yield for the reaction between 15.8 g of NH₃ and excess oxygen to produce 21.8 g of NO gas and water.
26. Determine the percent yield for the reaction between 98.7 g of Sb₂S₃ and excess oxygen if 72.4 g of Sb₄O₆ is recovered along with an unknown amount of sulfur dioxide gas.
27. Determine the percent yield for the reaction between 46.5 g of ZnS and 13.3 g of oxygen if 18.4 g of ZnO is recovered along with an unknown quantity of sulfur dioxide.