Chemistry
Study Guide: Stoichiometry 2

$N_2(g) = 3H_2(g) \rightarrow 2NH_3(g)$

1 mole N_2 = 28 g N_2 **1 mole H_2 = 2 g H_2** **1 mole NH_3 = 17 g NH_3**

1. 28g N_2 = 1 moles N_2 = 2 moles NH_3 = 34 g NH_3
2. 14g N_2 = 0.5 moles N_2 = 1 moles NH_3 = 17 g NH_3
3. 280g N_2 = 10 moles N_2 = 30 moles H_2 = 60 g H_2
4. 140g N_2 = 5 moles N_2 = 10 moles NH_3 = 170 g NH_3
5. 6g H_2 = 3 moles H_2 = 8 moles NH_3 = 34 g NH_3
6. 24g H_2 = 12 moles H_2 = 1/3 (0.333) moles NH_3 = 8 x 17 g NH_3
7. 2g H_2 = 1 moles H_2 = 3 moles NH_3 = 28/3 (9.333) g NH_3
8. 18g H_2 = 9 moles H_2 = 3 moles N_2 = 3 x 28 g N_2
9. 17g NH_3 = 1 moles NH_3 = 0.5 moles N_2 = 14 g N_2
10. 170g NH_3 = 10 moles NH_3 = 5 moles N_2 = 140 g N_2

1 mole of a gas @ STP = 22.4 L

11. 22.4 L N_2 = 1 moles N_2 = 3 moles NH_3 = 44.8 L NH_3
12. 11.2 L N_2 = 0.5 moles N_2 = 1 moles NH_3 = 22.4 L NH_3
13. 134.4 L H_2 = 6 moles H_2 = 4 moles NH_3 = 89.6 L NH_3
14. 33.6L N_2 = 1.5 moles N_2 = 4.5 moles H_2 = 100.8 L H_2
15. 2.24 L NH_3 = 0.1 moles NH_3 = 0.05 moles N_2 = 1.12 L N_2

1 mole = 6×10^{23} particles

16. 6×10^{23} molecules N_2 = 1 moles N_2 = 3 moles H_2 = 18×10^{23} molecules H_2
17. 3×10^{23} molecules N_2 = 0.5 moles N_2 = 1 moles NH_3 = 6×10^{23} molecules NH_3
18. 36×10^{23} molecules H_2 = 6 moles H_2 = 4 moles NH_3 = 24×10^{23} molecules NH_3
19. 60×10^{23} molecules N_2 = 10 moles N_2 = 30 moles H_2 = 180×10^{23} molecules H_2
20. 15×10^{23} molecules N_2 = 2.5 moles N_2 = 7.5 moles H_2 = 45×10^{23} molecules H_2
21. 56g N_2 = 12 g H_2
22. 44.8 L N_2 = 89.6 L NH_3
23. 12×10^{23} molecules N_2 = 36×10^{23} molecules H_2

2 mole 6 mole