

Answers to Stoichiometry Problems

1. a) $0.536 \text{ mol Li} \times (1 \text{ mol N}_2/6 \text{ mol Li}) \times (28.0 \text{ g N}_2/1 \text{ mol N}_2) = \mathbf{2.50 \text{ g N}_2}$
b) $46.4 \text{ g Li}_3\text{N} \times (1 \text{ mol Li}_3\text{N}/34.8 \text{ g Li}_3\text{N}) \times (6 \text{ mol Li}/2 \text{ mol Li}_3\text{N}) = \mathbf{4.00 \text{ mol Li}}$
c) $3.65 \text{ g Li} \times (1 \text{ mol Li}/6.94 \text{ g Li}) \times (2 \text{ mol Li}_3\text{N}/6 \text{ mol Li}) \times (34.8 \text{ g Li}_3\text{N}/1 \text{ mol Li}_3\text{N}) = \mathbf{6.10 \text{ g Li}_3\text{N}}$
d) $7.00 \text{ g N}_2 \times (1 \text{ mol N}_2/28.0 \text{ g N}_2) \times (6 \text{ mol Li}/1 \text{ mol N}_2) = \mathbf{1.50 \text{ mol Li}}$
2. a) $0.211 \text{ moles H}_2 \times (1 \text{ mol Sn}/2 \text{ mol H}_2) \times (118.7 \text{ g Sn}/1 \text{ mol Sn}) = \mathbf{12.5 \text{ g Sn}}$
b) $339 \text{ g SnO}_2 \times (1 \text{ mol SnO}_2/150.7 \text{ g SnO}_2) \times (2 \text{ mole H}_2\text{O}/1 \text{ mol SnO}_2) = \mathbf{4.50 \text{ mol H}_2\text{O}}$
c) $39.4 \text{ g Sn} \times (1 \text{ mol Sn}/118.7 \text{ g Sn}) \times (1 \text{ mol SnO}_2/1 \text{ mol Sn}) \times (150.7 \text{ g SnO}_2/1 \text{ mol SnO}_2) = \mathbf{50.0 \text{ g SnO}_2}$
d) $3.00 \text{ g H}_2 \times (1 \text{ mol H}_2/2.02 \text{ g H}_2) \times (1 \text{ mol Sn}/2 \text{ mol H}_2) \times (6.02 \times 10^{23} \text{ atoms}/1 \text{ mol Sn}) = \mathbf{4.47 \times 10^{23} \text{ atoms}}$
e) $1.20 \times 10^{21} \text{ molecules H}_2\text{O} \times (1 \text{ mol H}_2\text{O}/6.02 \times 10^{23} \text{ molecules}) \times (1 \text{ mol SnO}_2/2 \text{ mol H}_2\text{O}) \times (150.7 \text{ g SnO}_2/1 \text{ mol SnO}_2) = \mathbf{0.150 \text{ g SnO}_2}$