Ungraded "Problem Set" 3.5, Stoichiometry: Answers

1. 4.5 mol O_2; 3.1×10^2 g Al_2O_3

2. a) $4\ Fe(s)\ +\ 3\ O_2(g)\ \rightarrow\ 2\ Fe_2O_3(s)$
    b) 3.83 g Fe_2O_3
    c) 1.15 g O_2

3. a) $2\ C_6H_{14}(l)\ +\ 19\ O_2(g)\ \rightarrow\ 12\ CO_2(g)\ +\ 14\ H_2O(g)$
    b) O_2 is the limiting reactant. 187 g of CO_2 and 89.2 g of H_2O may be formed.
    c) 154 g of hexane remain.

4. a) 14.3 g $Cu(NH_3)_4SO_4$
    b) 88.1 % yield

5. a) titanium(IV) chloride; water; titanium(IV) oxide; hydrogen chloride (or hydrochloric acid)
    b) 4.60 g H_2O
    c) 10.2 g TiO_2; 18.6 g HCl

6. 268 mL