



$$a) \quad 4.00 \text{ mol Fe} \quad \frac{-1652 \text{ kJ}}{4 \text{ mole Fe}} = -1650 \text{ kJ}$$

$$b) \quad 1.00 \text{ mol Fe}_2\text{O}_3 \quad \frac{-1652 \text{ kJ}}{2 \text{ mol Fe}_2\text{O}_3} = -826 \text{ kJ}$$

$$c) \quad 1.00 \text{ g Fe} \quad \frac{1 \text{ mole Fe} \mid -1652 \text{ kJ}}{55.85 \text{ g Fe} \mid 4 \text{ mole Fe}} = -7.39 \text{ kJ}$$

$$d) \quad 10.0 \text{ g Fe} \quad \frac{1 \text{ mole Fe}}{55.85 \text{ g Fe}} = 0.179 \text{ mole Fe} \quad \frac{\quad}{4}$$

$$2.00 \text{ g O}_2 \quad \frac{1 \text{ mole O}_2}{32.00 \text{ g O}_2} = 0.0625 \text{ mole O}_2 \quad \frac{\quad}{3} *$$

$$0.0625 \text{ mole O}_2 \quad \frac{-1652 \text{ kJ}}{3 \text{ mole O}_2} = -34.4 \text{ kJ}$$

$$4b) \quad q = 1.3 \times 10^8 \text{ J}$$

$$1.3 \times 10^8 \text{ J} \quad \frac{100 \text{ J}}{60 \text{ J}} = 2.2 \times 10^8 \text{ J}$$

$$2.2 \times 10^8 \text{ J} \quad \frac{1 \text{ mole C}_3\text{H}_8 \mid 44.09 \text{ g C}_3\text{H}_8}{2.221 \times 10^6 \text{ J} \mid 1 \text{ mole C}_3\text{H}_8} = 4.4 \times 10^3 \text{ C}_3\text{H}_8$$

$$5a) \frac{50.0 \text{ mL } 1 \text{ L}}{1000 \text{ mL}} \bigg| \frac{0.100 \text{ mol/L}}{1 \text{ L}} = 5.00 \times 10^{-3} \text{ mole}$$



$$m \Delta H_{\text{sol}} = m \Delta T C_p$$

$$(5.00 \times 10^{-3} \text{ mole})(x) = (100.0 \text{ g})(23.4 - 22.60^\circ \text{C})(4.184 \frac{\text{J}}{\text{g}^\circ \text{C}})$$

$$x = \ominus 6600 \text{ J}$$

exothermic

$$6a) m \Delta H_{\text{sol}} = m \Delta T C_p$$

$$(10.5 \text{ g})(x) = (125 \text{ g})(24.2 - 21.1^\circ \text{C})(4.184 \frac{\text{J}}{\text{g}^\circ \text{C}})$$

$$x = \oplus 154 \frac{\text{J}}{\text{g}} \quad \frac{1 \text{ kJ}}{1000 \text{ J}} \bigg| \frac{119.0 \text{ g KBr}}{1 \text{ mole KBr}} = 18.4 \frac{\text{kJ}}{\text{mol}}$$

$$6b) 11.0 \text{ g CaCl}_2 \quad \frac{1 \text{ mol CaCl}_2}{110.98 \text{ g CaCl}_2} \bigg| \frac{81.5 \text{ kJ}}{1 \text{ mole CaCl}_2} = 8.08 \text{ kJ}$$

$$8080 \text{ J} = (125 \text{ g})(T_f - 25.0^\circ \text{C})(4.184 \frac{\text{J}}{\text{g}^\circ \text{C}})$$

$$T_f = 40.4^\circ \text{C}$$