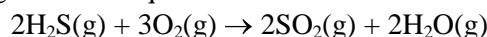
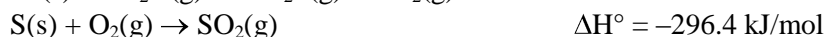
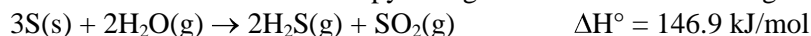


1. (3 Pts) Aluminum metal has a specific heat of $0.900 \text{ J/g}\cdot^\circ\text{C}$. Calculate the amount of heat required to raise the temperature of 10.5 moles of Al from 30.5°C to 225°C .
2. (3 Pts) Given the specific heat for aluminum is $0.900 \text{ J/g}\cdot^\circ\text{C}$, how much heat is released when a 3.8 g sample of Al cools from 450.0°C to 25°C .
3. (3 Pts) A 22.0 g block of copper at 45°C absorbs 2.50 kJ of heat. Given the specific heat of Cu is $0.385 \text{ J/g}\cdot^\circ\text{C}$ what will be the final temperature of the Cu?

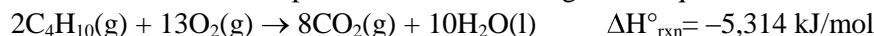
4. (4 Pts) During volcanic eruptions, hydrogen sulfide gas is given off and oxidized by air according to the following chemical equation:



Calculate the standard enthalpy change for the above reaction given:

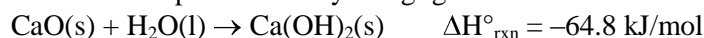


5. (4 Pts) The combustion of butane produces heat according to the equation



How many grams of CO_2 are produced per $1.00 \times 10^4 \text{ kJ}$ of heat released?

6. (4 Pts) 10.1 g CaO is dropped into a styrofoam coffee cup containing 157 g H_2O at 18.0°C . If the following reaction occurs, then what temperature will the solution reach, assuming that the cup is a perfect insulator and that the cup absorbs only a negligible amount of heat? (the specific heat of solution = $4.18 \text{ J/g}\cdot^\circ\text{C}$)



7. (4 Pts) The enthalpy change when a strong acid is neutralized by strong base is -56.1 kJ/mol . If 135 mL of 0.450 M HI at 23.15°C is mixed with 145 mL of 0.500 M NaOH, also at 23.15°C , what will the maximum temperature reached by the resulting solution? (Assume that there is no heat loss to the container, that the specific heat of the final solution is $4.18 \text{ J/g}\cdot^\circ\text{C}$, and that the density of the final solution is that of water (1.00 g/mL .)

Answer Key

1. 49.6 kJ
2. 1.5 kJ
3. 340.°C
4. -1036.1 kJ/mol
5. 662 g
6. 35.8°C
7. 26.06°C