In Class Practice

1. information provided to determine ∆H°rxn for the following reaction (5 points):

CH4 (g) + 3 Cl2 (g) 🡪 CHCl3 (g) + 3 HCl (g) ∆H°rxn = ?

|  |  |
| --- | --- |
| Substance | ∆H°f (kJ/mol) |
| CH4 (g) | -75 |
| CHCl3 (g) | -134 |
| HCl (g) | -92 |

1. A “coffee-cup” calorimeter contains 100.0 mL of 0.300 M HCl at 20.3°C. When 1.82 g Zn(s) is added, the temperature rises to 30.5°C. What is the heat of reaction (kJ) per mol Zn? Make the assumptions the specific heat of solution is the same as water (4.184 j/g\*ºC), density of solution is same as water (d=1.00 g/mL), and also that there is no heat lost to the H2 (g) that escapes.

Zn(s) + 2 H+(aq) → Zn2++ H2(g)

1. An ice cube of mass 9.0 g at temperature 0 °C is added to a cup of coffee, whose temperature is 90 °C and which contains 110 g of liquid. Assume the specific heat capacity of coffee is the same as that of water (4.184 J/g °C). The heat of fusion of ice (the heat associated with ice melting) is 6.0 kJ/mol. Find the temperature of the coffee after the ice melts (10 points).