

CHEM105 Announced Quiz 7

1. 15.4 grams of water was placed in a container and gained 30 J of heat energy. Calculate the change in entropy for this water at a temperature of 298K. Show all units.

2. A 150 gram metal container lost 30 J of heat energy when water was placed in it. Calculate the change in entropy for the metal container at a temperature of 299K.

3. Use fundamental science principles and your answers to the two previous questions to explain the real underlying reasons for why the metal container lost energy, why the water gained energy, and why the reverse process did not occur.

4. During late October / early November, the photodissociation of chlorine molecules in the stratosphere over Antarctica results in nearly complete destruction of stratospheric ozone.
 - a. Write the chemical equation of the dissociation of chlorine gas into chlorine atoms.

 - b. Predict whether the change in enthalpy would be positive or negative for this reaction and clearly explain why.

 - c. Predict whether the change in entropy would be positive or negative for this reaction and clearly explain why.

 - d. Predict the conditions under which the change in free energy would be positive or negative for this reaction and clearly explain why.