Intro to Thermochemistry

# Definitions

Write down all of the definitions given to you.

# Internal energy and Work

Write down the formulas and the meaning of each variable in the box below.

|  |
| --- |
| Internal Energy |

|  |
| --- |
| Work |

1. Calculate the work associated with the expansion of a gas from 46 L to 64 L at a constant external pressure of 15 atm.

2. Determine the change in energy, ΔE, for each system:

 A system gives off 25.0 kJ of heat and has 15.0 kJ of work done on it. \_\_\_\_\_

 A system takes in 75.0 kJ of heat and has 25.0 kJ of work done on it. \_\_\_\_\_

 A system does 45.0 kJ of work and loses 80.0 kJ of heat. \_\_\_\_\_

# Endothermic vs Exothermic

1. What is the difference between endothermic and exothermic reactions?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Draw a labeled diagram for an exothermic reaction.

3. Draw a labeled diagram for an endothermic reaction.

1. Consider the thermal energy transfer during a chemical process. When heat is transferred to the system, the process is said to be \_\_\_\_\_\_\_ and the sign of ΔH is \_\_\_\_\_\_\_\_.

 a) exothermic, positive

 b) endothermic, negative

 c) exothermic, negative

 d) endothermic, positive

2. When two solutions react the container “feels hot.” Thus,

 a) the reaction is endothermic.

 b) the reaction is exothermic.

 c) the energy of the universe is increased.

 d) the energy of both the system and the surroundings is decreased.

3. For the general reaction

 2 A + B2 → 2 AB, ΔH is +50.0 kJ.

 We can conclude that

 a) the reaction is endothermic.

 b) the surroundings absorb energy.

 c) the standard enthalpy of formation of AB is -50.0 kJ.

 d) the molecule AB contains less energy than A or B2.