Name: Date: Period:

Practice: Endothermic and Exothermic Reactions

**Part I: Common Processes**

*Directions: Classify each of the following processes as endothermic or exothermic. Explain your reasoning in the spot marked “rationale”*

|  |  |  |
| --- | --- | --- |
| **Process** | **Exothermic or Endothermic?** | **Rationale** |
| An ice cube melting |  |  |
| Cooking an egg |  |  |
| Burning a match |  |  |
| Freezing a soda |  |  |
| Digesting food |  |  |

**Part II: Chemical Reactions**

*Directions: Classify each reaction as exothermic or endothermic. Make sure to explain your reasoning.*

1. 2 H2O (l) + heat 🡪 2 H2 (g) + O2 (g)
2. Mg (s) + Cl2 (g) 🡪 MgCl2 (s) + heat
3. NH4NO3 (aq) + heat 🡪 NH4 + (aq) + NO3- (aq)
4. C6H12O6 (aq) + 6 O2 (g) 🡪 H2O (l) + 6 CO2 (g) + heat

**Part III: Word Problems**

1. When sodium hydroxide and hydrochloric acid are mixed together in solution, the temperature of the solution increases.
   1. Is this an endothermic or exothermic reaction?
   2. Is heat absorbed or released?
   3. Draw the reaction coordinate diagram for the reaction.
2. Cold packs are designed using an endothermic reaction. The reaction is shown below:

H2O + NH4Cl 🡪 NH3 + H3O+ + Cl-

* 1. Given that this is an endothermic reaction, which side (reactants or products) would heat be on? Explain your answer
  2. Is heat absorbed or released in this reaction?
  3. Would the temperature of the solution increase or decrease?
  4. Draw the general reaction coordinate diagram for an endothermic reaction