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| **Dougherty Valley HS AP Chemistry** | | **Name:** | |
| **Entropy of Reaction** | | **Date:** | |
|  |  | **Period:** | **Seat #:** |
|  |  | **Partner:** | |

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| **Quantitative Data Table [**fill in title**]:** | | | | |
|  | **Trials**  **[2 per cmpd]** | | **Calorimeter Constant** | |
| **1** | **2** | Mass of cold water (g) | 39.4118 |
| Mass of calorimeter (g) |  |  | Initial Temp of cold water (°C) |  |
| Mass of water (g) |  |  | Final Temp of mixed water (°C) |  |
| **Solid used**: |  |  | Temp. change cold water (Δ°C) |  |
| Mass of solid (g) |  |  | qcold water (J) |  |
| Moles of solid (mol) |  |  | Mass of hot water (g) | 38.6508 |
| Initial temperature (°C) |  |  | Initial Temp of hot water (°C) | 59.4 |
| Final temperature (°C) |  |  | Final Temp of mixed water (°C) |  |
| Temp. change (Δ°C) |  |  | Temp. change hot water (Δ°C) |  |
| Heat of reaction, J |  |  | qhot water (J) |  |
| ΔH, kJ/mole |  |  | qhot – qcold (J) |  |
| ΔS, J/mole∙K |  |  | Ccal (J/°C) |  |

\*To be completed after the experiment in the google doc

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| **Discussion Questions**: [individual] | **Your answers** |
| 1. Write a balanced equation for the reaction you studied (including the heat). | [Fill in answer here] |
| 1. Was the reaction spontaneous? How do you know this? Support and explain. | [Fill in answer here] |
| 1. From the temperature change of your trials, what must be the sign for ΔH? How do you know? Support. | [Fill in answer here] |
| 1. From question 3, what must be true about the sign for ΔS? Explain why with support? | [Fill in answer here] |
| 1. What are the units for entropy, ΔS? | [Fill in answer here] |
| 1. Many students believe that a reaction must be exothermic to be spontaneous. Comment on this in terms of this experiment. [Looking for detailed thought here for you to support both sides] | [Fill in answer here] |