Name: _____

Partner's Name: _____ Date: _____

Determination of Enthalpy Change of an Endothermic and Exothermic Chemical Process by Calorimetry

PART A: An Endothermic Chemical Process

DATA SHEET

******Always zero the balance before weighing******

1. Mass of Coffee cups + lid (g) _____
2. Mass of Coffee cups + lid + water (g) _____
3. Mass of Coffee cups + lid + water + $NaS_2O_3 \cdot 5H_2O$ (after stirring) (g) _____
4. Initial Temperature of water, $T_{initial}$ (°C) _____
5. Final Temperature of aqueous solution, T_{final} (°C) _____
6. Mass of solution (g) [Line 3 - Line 1]
7. Mass of $NaS_2O_3 \cdot 5H_2O$ (g) [Line 3 - Line 2] _____
8. Moles of $NaS_2O_3 \cdot 5H_2O$ (mol) _____
9. Heat of Dissolution (Q_{proc}, kJ) _____
10. Molar Enthalpy of Dissolution ($\Delta\overline{H}$, $kJ \cdot mol^{-1}$) _____

Show calculations for lines 6, 7, 8 ,9 and 10.

PART B: An Exothermic Chemical Process

11. Mass of Coffee cups + lid (g) _____

12. Mass of Coffee cups + lid + mixed (NaOH and HCl) solutions (after stirring) (g) _____

13. Initial Temperature of NaOH solution (^{o}C) _____

14. Initial Temperature of HCl solution (^{o}C) _____

15. Average Initial Temperature, $T_{initial}$ (^{o}C) _____

16. Final Temperature of aqueous solution, T_{final} (^{o}C) _____

17. Mass of final solution (g) [Line 12 - Line 11] _____

18. Moles of NaOH in 50.0 mL of 2.0 *M* NaOH solution(mol) _____

19. Moles of HCl in 50.0 mL of 1.5 *M* HCl solution (mol) _____

20. Heat of Neutralization (kJ) _____

21. Molar Enthalpy of Neutralization ($\Delta\overline{H}$, $kJ \cdot mol^{-1}$) _____