

Chemistry 1210
Solution Calorimetry

Date: _____

Name: _____

Partner: _____

OBJECT: To determine the enthalpy changes for a number of chemical reactions.

PROCEDURE: As in the Chemistry 1210 lab manual, pages 76-79.

OBSERVATIONS:

DATA and CALCULATIONS:

REACTION A

Run	Reagents	Volume	M	T _i	T _{i avg}	T _f	DT	q	DH
1	HCl NaOH								
2	HCl NaOH								

Sample calculation of q and ΔH :

REACTION B

Run	Reagents	Mass/ Volume	T _i	T _f	DT	q	DH
1	Na ₂ S ₂ O ₃ H ₂ O						
2	Na ₂ S ₂ O ₃ H ₂ O						
1	Na ₂ S ₂ O ₃ ·5H ₂ O H ₂ O						
2	Na ₂ S ₂ O ₃ ·5H ₂ O H ₂ O						

Sample calculation of q and ΔH:

REACTION C

Run	Reagents	Mass/ Volume	T _i	T _f	DT	q	DH
1	Mg ribbon HCl						
2	Mg ribbon HCl						

Sample calculation of q and ΔH:

REACTION D

Run	Reagents	Mass/ Volume	T _i	T _f	DT	q	DH
1	MgO HCl						
2	MgO HCl						

Sample calculation of q and ΔH :

REACTION E

E(i)

Run	Reagent s	M	Volume	T _i	T _{i avg}	T _f	DT	q	DH
1	H ₃ PO ₄ NaOH								
2	H ₃ PO ₄ NaOH								

Sample calculation of q and ΔH :

E(ii)

*note for E(ii) & E(iii) $T_{i \text{ avg}}$, volume of $\text{H}_3\text{PO}_4 \neq$ volume NaOH (calculate the weighted $T_{i \text{ ave}}$)

Run	Reagent s	M	Volume	T_i	$T_{i \text{ avg}}^*$	T_f	DT	q	DH
1	H_3PO_4 NaOH								
2	H_3PO_4 NaOH								

Sample calculation of $T_{i \text{ avg}}$, q, and ΔH :

E(iii)

Run	Reagent s	M	Volume	T_i	$T_{i \text{ avg}}^*$	T_f	DT	q	DH
1	H_3PO_4 NaOH								
2	H_3PO_4 NaOH								

Sample calculation of $T_{i \text{ avg}}$, q, and ΔH :

SUMMARY TABLE:

Reaction	DH(1)	DH(2)	DH(avg)	Literature DH
A) HCl + NaOH				
B ₁) Na ₂ S ₂ O ₃ + H ₂ O				
B ₂) Na ₂ S ₂ O ₃ ·5H ₂ O + H ₂ O				
C) Mg + HCl				
D) MgO + HCl				
E _i) H ₃ PO ₄ + NaOH				
E _{ii}) H ₃ PO ₄ + 2NaOH				
E _{iii}) H ₃ PO ₄ + 3NaOH				

Calculations of Literature ΔH for the above reactions (attach extra sheets as required):

Attach a discussion and assigned questions.