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Experiment Four – Thermochemistry

Data SheetName _____
Partner's Name _____ n/aDate _____ Lab Section: Day _____
[complete this sheet in ink] Time _____Part 1. Enthalpy of Neutralization of HCl(*aq*) with NaOH(*aq*)

Trial 1				Trial 2			
Temperatures (°C)				Temperatures (°C)			
1. 21.0	8. 27.7			1. 21.5	8. 28.2		
2. 21.0	9. 27.6			2. 21.6	9. 28.1		
3. 20.9	10. 27.5			3. 21.5	10. 28.0		
4. 21.0	11. 27.4			4. 21.5	11. 27.8		
5. 25.4	12. _____			5. 26.7	12. _____		
6. 27.8	13. _____			6. 28.3	13. _____		
7. 27.8				7. 28.2			

Solution Temperatures (°C): Initial, and at Time of Mixing (extrapolated)

Trial 1

Trial 2

HCl (also represents initial NaOH temp.)	_____	_____
"mixture" (extrapolated from the graph)	_____	_____

Heat gained by the solution	_____ J	_____ J
Heat of reaction ("–ve" of above)	_____ J	_____ J
Enthalpy of neutralization per mol of H ₂ O	_____ J/mol	_____ J/mol

Instructor's Acknowledgment _____ n/a

Experiment Four – Thermochemistry

Part 2. Enthalpy of Solution of NaOH(*s*)

	Trial 1			Trial 2			
	Temperatures (°C)			Temperatures (°C)			
1.	<u>20.6</u>	8.	<u>31.4</u>	1.	<u>21.0</u>	8.	<u>31.6</u>
2.	<u>20.7</u>	9.	<u>31.4</u>	2.	<u>21.1</u>	9.	<u>31.5</u>
3.	<u>20.8</u>	10.	<u>31.3</u>	3.	<u>21.2</u>	10.	<u>31.4</u>
4.	<u>20.8</u>	11.	<u>31.0</u>	4.	<u>21.1</u>	11.	<u>31.4</u>
5.	<u>24.4</u>	12.	_____	5.	<u>24.8</u>	12.	_____
6.	<u>31.5</u>	13.	_____	6.	<u>31.9</u>	13.	_____
7.	<u>31.5</u>			7.	<u>31.8</u>		

Solution Temperatures (°C): Initial, and at Time of Mixing (extrapolated)

Trial 1

Trial 2

"distilled" water _____

"mixture" (extrapolated) _____

Mass of NaOH 2.01 g 2.01 g

Heat gained by solution _____ J _____ J

Heat of reaction

(-ve of heat gained) _____ J _____ J

Enthalpy of solution

per mol of NaOH(*s*) _____ J/mol _____ J/molInstructor's Acknowledgment n/a

Experiment Four – Thermochemistry

Part 3. Enthalpy of Reaction of HCl(*aq*) and NaOH(*s*)

	Trial 1			Trial 2		
	Temperatures (°C)			Temperatures (°C)		
1.	20.2	8.	32.3	1.	21.0	8.
2.	20.3	9.	32.2	2.	21.1	9.
3.	20.3	10.	32.1	3.	21.1	10.
4.	20.2	11.	32.0	4.	21.1	11.
5.	24.4	12.	_____	5.	24.9	12.
6.	32.4	13.	_____	6.	33.2	13.
7.	32.5			7.	33.3	

	Solution Temperatures (°C) at Time of Mixing	
	Trial 1	Trial 2
diluted (<i>i.e.</i> 0.60 M) HCl	_____	_____
"mixture" (extrapolated)	_____	_____
Mass of NaOH	<u>1.98</u> g	<u>1.98</u> g
Heat gained by the solution	_____ J	_____ J
Heat of reaction (-ve of above)	_____ J	_____ J
Enthalpy of reaction per mol of NaOH(<i>s</i>)	_____ J/mol	_____ J/mol

Instructor's Acknowledgment _____ n/a _____



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