	GILES CHEMICAL		
	COMPANY PROCEDURE		
	Validation of the Specific Gravity vs. % MgSO ₄ Reference Chart	Page : 1 of 4	Revision : 01 Date : 07/06/2009
	Author: Carl Mooney	Job Specific	

Safety: Wear the appropriate lab PPE when working in the lab.

Purpose: VALIDATION OF THE SPECIFIC GRAVITY vs. % MgSO₄ REFERENCE CHART

Procedure:

Introduction

The Specific Gravity of solutions of MgSO₄ is used for intermediate process control and for the marketing of Liquid Product . A reference chart is needed to easily and quickly convert Specific Gravity determinations to percent Magnesium Sulfate. Such a chart is generated by a simple analytical procedure which follows. Some 1200 reference points may be required over time, and an analysis for all of those is not physically possible, hence some, particularly those at the higher temperatures, are derived by extrapolation.

Procedure


The weight of a known volume of solution at a temperature is determined, thus establishing a value for Specific Gravity, and a known weight of the same solution is evaporated and heated to the anhydrous state, thus establishing a value for % MgSO₄.

Equipment

25 mL Volumetric Flask
 4 mL. Transfer Pipette
 20-100°C Laboratory Thermometer
 100 mL Porcelain Crucible
 Weighing Balance – B440 Sartorius
 105°C Drying Oven
 1000°C Furnace
 Laboratory Dessicator
 Oven Forceps

Method

1. Place the volumetric flask on the weighing balance and tare the reading to zero.
2. Fill the flask with solution to the mark, using the pipette to adjust as necessary.
3. Place the flask back on the balance and record the weight. **This is the weight of 25 mL, of solution. Divide this number by 25 to obtain the Specific Gravity.**
4. Using the thermometer, thrust the bulb down the neck of the flask into the wider part, meanwhile being careful to not displace the contents of the flask by overflowing. Read and record the temperature. **This is the temperature parameter to be used when entering values on the Specific Gravity vs. MgSO₄ reference chart.**
5. Set the weighing balance to read zero.
6. Place the porcelain crucible on the weighing balance and record the weight.
7. Pour the contents of the volumetric flask into the crucible.
8. Place the crucible on the balance and record the weight

	GILES CHEMICAL		
	COMPANY PROCEDURE		
	Validation of the Specific Gravity vs. % MgSO ₄ Reference Chart	Page : 2 of 4	Revision : 01 Date : 07/06/2009
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9. Subtract the weight at item 5 from the weight at item 7. **This is the weight of the sample**
10. Rinse the flask well with DI water and add the rinse to the crucible.
11. Place the crucible in the drying oven @ 105°C for two (2) overnights.
12. Using forceps remove the crucible and place it in the 450°C furnace for about one hour.
13. Remove the crucible from the furnace using the tongs, and place the crucible in the dessicator until cool.
14. Place the crucible on the balance and record the weight.
15. Return the crucible to the furnace for about 15 minutes and reweigh.
16. If the weight is less than in item 11 repeat item 12 as necessary to constant weight.
17. Subtract the weight of the crucible, item 5, from the weight at item 13. **This is the weight of anhydrous MgSO₄ in the solution sample weighed at item**
18. Divide the weight of the sample at item 16 by the weight at item 8. **This is the percent anhydrous MgSO₄ in the solution sampled.**

Weight of volume of Solution = Specific Gravity
Weight of equal volume of Water

Weight of dehydrated solids = % MgSO₄
Weight of solution sample



**GILES CHEMICAL
COMPANY PROCEDURE**

**Validation of the Specific Gravity vs. % MgSO₄
Reference Chart**

Page : 3 of 4

Revision : 01
Date : 07/06/2009

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Job Specific

TRAINING DOCUMENTATION

	EMPLOYEE	TITLE	SIGNATURE	DATE
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Revision	:	01
Date	:	07/06/2009

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