	GILES CHEMICAL							
	COMPANY PROCEDURE							
ailes	Validation of Reference Cha	the Specific Gravity vs. % MgSO4	Page :	1 of 4	Revision Date	:	01 07/06/2009	
	Author:	Carl Mooney	Job Spec	eific				

**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**

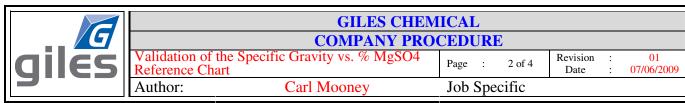
The weight of a known volume of solution at a temperature is determined, thus establishing a value for Specific Gravity, and a known weight of the same solution is evaporated and heated to the anhydrous state, thus establishing a value for % MgSO4.

### **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



- 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.

<u>Weight of volume of Solution</u> = Specific Gravity

Weight of equal volume of Water

Weight of dehydrated solids = % MgSO4

Weight of solution sample



## **GILES CHEMICAL**

Validation of the Specific Gravity vs. % MgSO4
Reference Chart

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Carl Mooney

Job Specific

## TRAINING DOCUMENTATION

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# GILES CHEMICAL

Validation of the Specific Gravity vs. % MgSO4
Reference Chart

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Revision Number	Revision Date	Revision Author	Revision Description
00	3/28/2006	PLO	Original document
01	7/6/2009	PLO	Updated format and corrected spelling errors