

GILES CHEMICAL CORPORATION		
COMPANY PROCEDURE		
Standard Operating Procedure	Page : 1 of 3	Revision : Date : 3/28/06
Reviewed: Carl Mooney	Title: FILTERABILITY OF CRUDE MgSO ₄ BRINE	

QA-LAB-11

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

Purpose: FILTERABILITY OF CRUDE MgSO₄ BRINE

Procedure:

Background Information:

In the Giles manufacturing process MgO (Magnesite) is combined with sulfuric acid in aqueous medium to form soluble magnesium sulfate. Certain impurities in the magnesite as received wither are, or form, insoluble compounds which must be removed by filtration to allow pure MgSO₄ to be produced in liquid or crystalline form. Since magnesite is received from various sources it is interesting and perhaps economically viable to determine the difference, if any, in the filterability of brines generated from the different source materials. This procedure is designed to determine if a difference exists, and to what extent.

Note: It is important to recognize that magnesite is received in large dry cargo railroad tanks cars and is stored in silos holding as much as three cars each. It is therefore impossible to state as a certainty that a brine sample obtained at any given time is positively derived from any particular source unless care is taken to review the pattern of receipts, usage, and storage location details.

Scope :

Samples are drawn from the so-called third digester tanks, taking care to flush the outlet piping to be sure that the sample is representative of the contents of the tank. A measured portion of the sample is vacuum filtered at a standard tem[erature for a standard time interbal using a standard filter paper and standard vacuum pump setting. The amount of filtrate collected during the time interval is measured and used as the indicator of filterability.

Equipment:

Sample vessel : Plastic container holding at least 500 ml

Hydrometer :

Glass Beaker : 150 ml

Plastic Laboratory Cup : 250 ml

Microwave Oven : Domestic

Laboratory Thermometer : In °C

Laboratory Graduate : 250 ml.

Bunchner Filter Funnel : 10 cm. Ceramic

Vacuum Filter Flask : 250 ml. Pyrex

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Vacuum Pump : Boekel Hy-Vac 30 Liter Direct Drive. Capacity 26" Hg. Fitted on the intake side with a Vacuum gauge calibrated in inches of mercury and a needle valved by-pass.

Filter Paper : Baxter 90 mm. S/P Grade 361 Qualitative

Stop Watch

Procedure :

- Using Sampling Vessel - Choice of Tank for which sample is to be taken is made

The origin of the magnesite from which this brine is derived is to be noted

- Outlet valve of tank is opened

Flushed briefly until it the emitting brine is a representative of the tanks

- Take Sample consisting of 400 ml. or more to the laboratory.

Using a Hydrometer - Sample is to be between 1.300 and 1.350

Add hot water if reading is high – this prevents crystal formation during cooling

- Place App. 200ml. in the glass beaker and heat using microwave oven as necessary to achieve 70 °C
- Vacuum Filtration assembly is prepared, filter paper is inserted into funnel, and the pump started
- 200 ml. are placed atop the paper in the funnel
- Immediately Start Stop watch
- The filtration is allowed to progress for exactly three minutes during which time the vacuum is maintained at 5 (five) inches of mercury by adjusting the needle valve as necessary
- The filtrate is measured using the graduate and is recorded as the indicating parameter for the filterability of the sample

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TRAINING DOCUMENTATION

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