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	Measurement of Particulate (MgO) Emission from Digester Vent Stacks	Page : 1 of 4	Revision : 01 Date : 06/26/2009
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Personnel responsible:

Lab Personnel

Safety: Observe all area and lab PPE requirements

Purpose: Estimate the MgO emissions from the Digesters for Air Quality Permit.

Introduction

Giles Chemical operates under an **NCDENR PERMIT TO DISCHARGE**. Magnesite (MgO) and salt dust are the only particulates generated by Giles and both are controlled. For regulatory purposes measurements may have to be taken from time to time. This procedure allows a close estimation of discharge of MgO from digester vent stacks

Procedure


The digester tanks are both equipped with vent stacks through which particulate magnesite has to pass. A wooden frame has been constructed to which loosely woven (tobacco) cloth can be attached and placed in the discharge stream, thus capturing most of the magnesite being emitted. The exposure time of the cloth to the stream is measured, the cloth folded to retain the particulates, dried, and weighed. The result is calculated in terms of pounds per day.

Equipment

Loosely woven fabric – cheese or tobacco cloth
 Wooden Frame
 Stop Watch
 Drying Oven – S/P TemoCon NB 6205
 Weighing Scale – B440 Sartorius

Method

1. Cut a section of the collection cloth to be used 28" x 28" square.
2. Weight the cloth on the laboratory scale. **Record the weight.**
2. Obtain the wooden frame at its storage location and attach the cloth to the frame securely over the protruding nails.
3. Proceed to the stack to be tested
4. With stop watch at the ready, invert the frame and place it over the vent stack with the nails facing downward.
5. Start the watch immediately. Carefully time the exposure period from the moment of placing the cloth over the stack to the moment of removal.
 Timing may have to be adjusted depending upon the amount of dust being emitted and the vapor condensation encountered. A trial run or two may be needed.
 Generally, the shorter the time the better since excess condensation will induce dripping and introduce error.
6. Allow about two minutes exposure time, then quickly remove and invert the cloth covered frame. **Record the time.**
7. Carefully remove the cloth from the inverted frame, folding the cloth inward to avoid loss of accumulated material.

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8. Place the cloth with contents in the drying oven overnight.
9. Weigh the cloth on the laboratory scale. **Record the weight.**
10. Subtract the weight at item 9 from the weight at item 2. **This is the grams of magnesite emitted during the exposure period.**

Calculation

Determine the grams per minute by dividing the grams by the number of minutes.

Particulate emission for permit purposes is expressed in terms of Tons Per Year.

Grams per ton = 454 (g / pound) x 2000 (lbs./ ton) = 908,000

The operating time of the digesters is estimated to be 75%.

$$= 0.75 \times 60 \times 24 \times 365 = 394,200$$

For two digesters, say 788,400 minutes.

788,400 x grams/minute divided by 908,000 = tons per year.



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TRAINING DOCUMENTATION

	EMPLOYEE	TITLE	SIGNATURE	DATE
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