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FloMag® H/HUS Magnesium Hydroxide Slurry
Wastewater Testing Guidelines for
Acid Neutralization/Heavy Metals Precipitation

1. Measure the pH of a representative sample of the wastewater sample to be tested. If appropriate, measure the metals concentration in a filtered sample of the solution.

2. Using a pH meter and probe, titrate, while stirring, an accurately measured volume (recommended volume: at least one Liter) of the wastewater sample with standardized NaOH to the target pH and retention time of the wastewater neutralization/heavy metal precipitation process. (If the solution is very acidic, use 0.5N or 1.0N NaOH. For more moderate solutions, use 0.1N or 0.05N NaOH). Structure the titration so that the volume of standardized NaOH needed is between 20 and 40 mL when using a 50 mL burette. The normality of the standardized NaOH will be called "N_B" in the calculation in Step 4. The titrated sample may be used for comparison with the FloMag H/HUS treated sample in Step 8.

3. Repeat Step 2 three times and average the results of the three titrations. This average expressed in liters will be called "V_B" in the calculation in Step 4.

4. Calculate the equivalent amount in grams of FloMag H/HUS Slurry using the following calculation:

$$g(\text{Slurry}) = 49.8 * N_B V_B, \text{ for FloMag}^{®} \text{ H/HUS Slurry}$$

5. Accurately measure out the required volume of wastewater solution to be neutralized. If this is the same amount used in the titrations in Step 2, accurately weigh out the amount of FloMag H/HUS calculated in Step 4. If not, adjust the amount proportionally. For example, if the titrated volume was 1.0 L and the volume to be neutralized by the FloMag H/HUS product is 1.5 L, multiply the result in Step 4 by a factor of 1.5.

   NOTE: Since the mass calculated in Step 4 is likely to be very small, it is extremely important to be sure that all of the FloMag H/HUS product is added to the sample. It is equally important to insure that the solution temperature is approximately that of the process stream at the neutralization stage of the treatment.

   NOTE: For FloMag H/HUS, it may be easier to first weigh the FloMag H/HUS into the neutralization vessel and then add the wastewater sample to the FloMag H/HUS. It is also important that the FloMag H/HUS sample be well mixed before it is weighed out.

6. While measuring the pH, add, with agitation, the FloMag H/HUS to the solution and allow to mix. Begin timing.

7. Measure the amount of time required to reach the desired pH range. While bearing in mind that systems with clarifiers provide additional reaction time, compare the required reaction time with the measured neutralization time for the FloMag H/HUS product. If the FloMag H/HUS product is much too slow for the process, try adding a slight excess while repeating Step 6 on a fresh wastewater sample.

   Note: A slight excess would be 10% to 30% more of the FloMag H/HUS product. More than 30% will most likely be an inefficient use of the magnesium hydroxide since much of the magnesium hydroxide may not be reacting to raise the pH to the desired level. Note that the higher undissolved solids could then raise the Total Suspended Solids in the final sample.

8. Once Steps 6 and 7 are satisfactorily completed, if desired, the flocculent used in the process may be added next, taking care to avoid excessive agitation, which might damage the flocculent.

9. Place the treated solution in a graduated cylinder and let settle for up to 24 hours. Measure the sludge volume once the solids have settled out.

10. Filter the treated solution and measure the metal content of the filtrate.

11. Note the difference in the appearance, volume, and % solids of the sludge generated by the FloMag H/HUS product and NaOH. The % solids may be measured by weighing the sludge sample before and after drying at 110^{O}C. The higher % solids and lower volume of sludge typically generated by FloMag H/HUS products often results in significant savings in sludge disposal costs.

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