RoQuest Jar Test Procedure



Introduction

Jar tests are performed in the laboratory to determine the optimum coagulant dosages to be used within flocculators/clarifiers.

The ideal apparatus used to conduct these tests is a gang-stirrer as shown in Figure 1 below. The unit is a motorized device capable of stirring water samples at precise speeds with stainless steel paddles. The typical gang-stirrer holds six beakers that may all be stirred at the same time. The paddle speed should be adjustable in order to simulate the rapid mixing and flocculation chambers of flocculators/clarifiers.

Coagulation/flocculation tests are conducted by introducing gradated dosages of coagulant to the water samples. After an initial rapid mix phase, paddle speed is reduced to promote flocculation. At the end of the flocculation period, stirring is stopped and a visual determination is made of the floc size and the clarity of the water between the flocculated particles. The speed at which the flocculated particles settle to the bottom of the beakers is also noted.

Finally, water is decanted from the beakers and filtered through #2 Whatman filter paper. Turbidity readings made on the filtered samples simulate the results expected from filters following the clarification process.

Procedures

A RoQuest product dilution must be made prior to conducting the jar test. A suitable working solution consists of a 1% RoQuest solution. This



Figure 1: Six Beaker Gang Stirrer



is prepared by weighing-out one gram of the RoQuest test product and dissolving it in 100mL of DI water.

This solution is stable for one week, after which a fresh solution should be prepared. Table 1 lists the ml of RoQuest required to give the indicated dosage when added to 500 ml of sample.

After the dilution has been made, add 500 ml of the water to be tested to each of the beakers in the jar test apparatus (usually 6). Add the number of ml of RoQuest dilution indicated in the table. Do not add RoQuest to the first beaker which serves as a control. Stir the beakers at 100 rpm for one minute before reducing the speed to 15-20 rpm. Continue to stir at this speed for 30 minutes.

At the end of the flocculation period, note the size of the floc particles and the visual clarity of the water between floc particles. Stop the paddle rotation and observe the relative speed in which floc particles settle to the bottom of the beakers.

After the floc particles have settled to the bottom of the beakers, decant water from each beaker and filter through #2 Whatman filter paper. Measure the turbidities of these samples with a turbidimeter.

Evaluation

The optimum coagulant dosage is that which produces large, fast settling floc and clear water between floc particles. The optimum dosage will also produce the lowest turbidity in the filtered water.

RoQuest Dosage,	ml RoQuest
ppm	Dilution
3	0.25
10	0.50
15	0.75
20	1.0
30	1.5
40	2.0
50	2.5

Table 1.7 Determining the ml dilution of RoQuest

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