Operator Quiz Test No. 111 – Disinfection

The following questions are designed for trainees as they prepare to take the ABC wastewater operator test. It is also designed for existing operators to test their knowledge. Each issue of *Clear Waters* will have more questions from a different section of wastewater treatment. Good Luck!

1. Calculate the chlorine demand given the following information:
   Feed rate = 150 lbs. /day
   Flow = 11.5 MGD
   Measured chlorine residual = 0.5 mg/L
   a. 1.06 mg/L
   b. 1.56 mg/L
   c. 2.06 mg/L
   d. There is not enough information to determine the chlorine demand.

2. Chlorine gas is:
   a. Lighter than air
   b. Heavier than air
   c. Has a "rotten egg" smell
   d. Is safe to breath in concentrations of less than 500 ppm.

3. Which of the following would be used to detect a chlorine leak:
   a. Sodium Hydroxide   c. Ammonia
   b. Ferric Chloride   d. Nitric Acid

4. A chemical commonly used for dechlorination is:
   a. Sodium Hypochlorite   c. Ozone
   b. Sulfur Dioxide   d. Fluoride

5. Which of the following methods is not used to determine chlorine residual:
   a. Amperometric Method
   b. DPD Method
   c. Iodometric Method
   d. Winkler Method

6. Subtracting the chlorine residual from the chlorine dose is:
   a. Chlorine Feed Rate
   b. Chlorine Demand
   c. MPN (Most Probable Number)
   d. Alkalinity

7. Pathogenic organisms can be removed from the wastewater treatment process by which of the following:
   a. Physical removal through sedimentation and filtration
   b. Die-off through natural means and unfavorable environmental conditions
   c. Destruction by chemicals added to the treatment process
   d. Pathogenic organisms can be removed by all of the above

8. Which of the following treatment processes is not an acceptable way to ensure all pathogenic microorganisms are destroyed:
   a. Chlorination
   b. Filtration
   c. Ultraviolet light
   d. Ozone

9. The addition of chlorine gas into water represented by the following equation can most accurately be described as yielding which of the following?:
   $Cl_2 + H_2O \rightarrow HCl + HOCl$
   a. Hypochlorous and hydrochloric acids
   b. Sodium hypochlorite and water
   c. Sodium hypochlorite and hydrochloric acid
   d. Hypochlorous acid and sodium hydroxide

10. Calculate the chlorine dosing rate in lbs/day given the following information:
    Chlorine demand, mg/L = 16 mg/L
    Chlorine residual, mg/L = 2.0 mg/L
    Flow, MGD = 5.5 MGD
    a. 8.26 mg/l
    b. 826 lbs/day
    c. 8.26 lbs/day
    d. 8.26 mg/l

11. Which of the following parameters is not considered when operating a disinfection system using ultraviolet light?:
    a. Keeping the UV channel water at a constant level
    b. Preventing an excessive water level above the top lamp row
    c. Keeping the UV lamps submerged at all times
    d. Maintaining the proper chlorine residual in the effluent

12. Calculate the chlorine residual given the following information:
    Dosing rate = 5.8 mg/L
    Flow = 80 MGD
    Chlorine demand = 4.5 mg/L
    a. 1.3 mg/L
    b. 10.3 mg/L
    c. 0.3 mg/L
    d. 0.93 mg/L

13. Given the information in the previous question, calculate the required pumping rate of 15% sodium hypochlorite.
    a. 3096 lbs/day
    b. 3870 gallons/day
    c. 3096 gallons/day
    d. 1251 lbs/day

For those who have questions concerning operator certification requirements and scheduling, please contact Tanya May Jennings at 315-422-7811 ext. 4, tmj@nywea.org, or visit www.nywea.org/OpCert.

Answers from page 61: 1 A, 2 B, 3 C, 4 B, 5 D, 6 B, 7 D, 8 B, 9 A, 10 B, 11 D, 12 A, 13 C