

Operator Quiz Corner – Chlorination
(Dan Laprade, Training Coordinator)

In the early 20th century water borne diseases like typhoid were very common in the United States. It took a great deal of persuasion, but a physician named Dr. John Leal, was able to convince Jersey City, New Jersey to become the first US city to practice the addition of chlorine to drinking water. That was in 1908 and the rapid drop in cases of typhoid prompted many other cities to follow suite. Within ten years roughly 33 million people in the US were getting chlorinated water.

Whether it is understanding how to calculate CT for compliance purposes or follow an AWWA method of disinfecting a newly installed section of water main. both water treatment and distribution operators, need to have a basic understanding of chlorination.

Answers to the following chlorination problems can be found by going to the MWWA website and clicking on the “Education” tab and click the link under the heading “Answer to Chlorination Practice Problems”.

- 1) Which of the following terms describes the process of adding both chlorine and ammonia to form monochloramine – a desirable distribution system disinfectant?
 - a) Breakpoint chlorination
 - b) Chloramination**
 - c) Free available chlorine
 - d) Nitrification

- 2) Which of the following describes the process of adding chlorine to water until the chlorine demand has been met and further addition of chlorine will result in a chlorine residual directly proportional to the amount of chlorine added?
 - a) Breakpoint chlorination**
 - b) Chloramination
 - c) Free available chlorine
 - d) Nitrification

- 3) Which of the following statements is true with regards to how pH affects chlorine?
 - a) Chlorine is more effective in water with a high pH
 - b) Chlorine is more effective in water with a low pH**
 - c) Chlorine is more effective at a neutral pH of 7.0
 - d) Chlorine’s effectiveness is not impacted by the water’s pH

- 4) The formation of the disinfectant byproducts of Trihalomethanes and Haloacetic Acids is caused when chlorine reacts with water containing _____.
 - a) Natural Organic Matter**
 - b) Manganese
 - c) Ammonia
 - d) Nitrogen

- 5) The residual concentration of a given disinfectant in mg/L multiplied by the disinfectant’s contact time in the water is called _____.
 - a) CT value**
 - b) Chloramination

- c) 90th Percentile
- d) Locational Running Annual Average