Technical Information:

Date: February 2006
Subject: Water Treatment DPD Test
Product: DPD Test For Oxidants

The DPD test is used extensively in water treatment to determine the level of disinfectant present. In most cases this is Free Chlorine but it can be used to measure other parameters (oxidants). It is a quick and relatively easy test which requires little background or skill to perform.

DPD Stands For Diethyl – P - Phenylenediamine

From the DPD test, the following parameters can be checked.

Free Chlorine
Total Chlorine
Combined Chlorine
Bromine
Chlorine Dioxide
Ozone

With our DT1 Photometer test kits, liquid buffer / reagents are used for the test. These allow for a fast homogeneous mixing. The DT Photometer also allows selection of the specific parameter to be measured.

The DPD test is available from a number of manufacturers. Many of them only allow a Free Chlorine or a Total Chlorine test. With a little knowledge – the other parameters can be derived.

A similar measurement procedure done in all cases. A sample of the water is taken and a zero test is done. A buffer is added to the solution to reduce the pH, a reagent is added and the measurement is done. The oxidant value is proportional to the intensity of the red colour produced. This is easily determined by the photometer. Depending on the manufacturer the buffer / reagent can be either liquids, powder or a tablet.

Free Chlorine.
Most common test done. After doing a zero test, the buffer/reagent is added. The reading should be done within 10 seconds for best accuracy.

Total Chlorine
A zero test is done, the buffer . reagent added and then you normally have to wait for a defined amount of time before a reading is taken.

Combined Chlorine
Can be determined by doing a Free and Total test then subtracting the Free from Total value.

For Bromine, Chlorine Dioxide and Ozone, the value can be determined by the ratio of the electrons transferred / molecular weights. With the DT Photometers this is done automatically if you select the particular parameter. With a non specific test the following can be done.

Cl_2 + 2e- -> 2 Cl-	71 /2 g Chlorine (35.5)
Br_2 + 2e- - > 2 Br-	160 /2 Bromine (80)
ClO_2 + e- -> ClO_2-	67.5 g Chlorine Dioxide (67.5)
O_3 + 2e- + H_2O -> O_2 + 2 OH-	48 /2 g Ozone (24)

Bromine.
Do the standard Free Chlorine test and multiply the result by 2.25 for the Bromine value.
The 2.25 multiplier is needed due to the ratio of Br 80g to Cl 35.5g

Chlorine Dioxide
Do the standard Free Chlorine test and multiply the result by 1.9 for the Chlorine Dioxide value.
The 1.9 multiplier due to the ratio of ClO_2 67.5g to Cl 35.5g

Ozone
Do the standard Total Chlorine test and multiply the result by 0.68.
The 0.68 multiplier due to the ratio of Ozone 24g to Cl 35.5 g

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