

Field Determination of Dibromonitripropionamide (DBNPA) In Water
Using Two DPD Color Methods

A. Using a Spectrophotometer for Chlorine

Equipment and Reagents

Chlorine – Pocket Colorimeter. Hach Model 46700-00 (or equivalent)
DPD TOTAL Chlorine Reagent Powder Pillows for 10 ml sample size. Hach Product number 21056-69. ***Important note:*** Do ***NOT*** use DPD FREE Chlorine Reagent Powder Pillows.

Procedure

Before testing, make sure the instrument is in the low (LO) range mode by checking that the display reads to hundredths (0.00)

Note: This method assumes there is no background chlorine or bromine present.

- (1) Fill both 10 ml sample cells with the water sample. Designate one of these to be the blank and one to be the prepared sample.
- (2) Add the contents of one DPD TOTAL Chlorine powder pillow to the prepared sample cell.
- (3) Cap the prepared sample cell and shake gently to mix the DPD powder. A pink color will develop indicating the presence of DBNPA.
- (4) Wait 3 minutes. *Waiting less time may result in low readings.*
- (5) Place the blank cell in the cell holder with the diamond mark facing you. Cover the cell compartment with the instrument cap to shield from stray light interferences and then press ZERO.
- (6) The instrument will turn on and the display will show “---“ then 0.00. Remove the blank cell and replace it with the prepared sample cell. Align the cell and cover the cell compartment and then press READ.
- (7) The instrument display will show “---“ followed by the results in ppm total chlorine. This is the ppm total Cl₂ DBNPA value.

Calculation

$$\text{ppm as DBNPA} = 1.7 \times \text{ppm total Cl}_2 \text{ reading}$$

B. Using a Color Wheel Comparator for Chlorine

Equipment and Reagents

Chlorine – Total. Hach Model CN-66 (or equivalent)
DPD TOTAL Chlorine Reagent Powder Pillows for 5 ml sample size. Hach Product number 14076-99. ***Important note:*** Do ***NOT*** use DPD FREE Chlorine Reagent Powder Pillows.

Procedure

Note: This method assumes there is no background chlorine or bromine present.

- (1) Fill both sample vials to the 5 ml mark with the water sample. Designate one of these to be the blank and one to be the prepared sample.
- (2) Add the contents of one DPD TOTAL Chlorine powder pillow to the prepared sample vial.
- (3) Cap the prepared sample cell and shake gently to mix the DPD powder. A pink color will develop indicating the presence of DBNPA.
- (4) Wait 3 minutes. *Waiting less time may result in low readings.*
- (5) Place the blank vial in the top left opening of the color comparator and place the prepared sample cell in the top right opening.
- (6) Hold the comparator up to a light source such as the sky (or against a white background).
- (7) Rotate the color disc until the color matches in the 2 openings
- (8) Read the ppm total chlorine in the scale window. This is the ppm total Cl₂ DBNPA value.

Calculation

$$\text{ppm as DBNPA} = 1.7 \times \text{ppm total Cl}_2 \text{ from color wheel}$$