

Guidelines and tips for conducting

## Liquid DPD Colorimetric Test

Steps Taken	What is being introduced	What is happening	Things to remember	Other notes	
<b>0</b>	Make sure that your test tube has been thoroughly rinsed before you begin testing. Any small amount of the third reagent (iodide) leftover from the previous test will interfere with the free chlorine reading. It might be a good idea to have a test tube dedicated to free chlorine testing and another test tube dedicated to combined chlorine testing.				
<b>1</b>	Fill the test tube with sample water	<ul style="list-style-type: none"> <li>• Water</li> <li>• Free chlorine (if any)</li> <li>• Combined chlorine (if any)</li> </ul>	N/A	<ul style="list-style-type: none"> <li>• Take samples of representative water</li> <li>• Fill it to the correct amount</li> </ul>	<ul style="list-style-type: none"> <li>• Wrong amount of sample will skew the result</li> <li>• Hold it at your eye level</li> <li>• Be mindful of meniscus</li> </ul>
<b>2</b>	Add the first reagent (pH=10.0)	Might be different depending on manufacturer <ul style="list-style-type: none"> <li>• Phosphate</li> <li>• Other chemicals</li> </ul>	Introducing buffer agent (phosphate) to condition the sample for DPD test	<ul style="list-style-type: none"> <li>• Use correct drop size</li> <li>• Do not use expired reagent</li> </ul>	<ul style="list-style-type: none"> <li>• Sample might turn cloudy if there is much hardness in the sample. This will not affect the test result.</li> </ul>
<b>3</b>	Add the second reagent (pH=1.3)	Might be different depending on manufacturer <ul style="list-style-type: none"> <li>• DPD</li> <li>• Other chemicals</li> </ul>	Free chlorine reacts quickly with DPD to produce Würster dye (red). Too much chlorine will bleach out the Würster dye and result in false low reading	<ul style="list-style-type: none"> <li>• Use correct drop size</li> <li>• Do not use expired reagent</li> <li>• If the resulting red color is at 5.0 ppm or darker, dilution is necessary</li> </ul>	<ul style="list-style-type: none"> <li>• Get the reading as quickly as possible</li> <li>• Waiting for more than a minute may result in monochloramine interference</li> <li>• Follow the test kit instruction on how to perform dilution</li> </ul>
<b>4</b>	Add the third reagent (pH=7.6)	Might be different depending on manufacturer <ul style="list-style-type: none"> <li>• Potassium iodide (KI)</li> <li>• Hydriodic acid</li> <li>• Other chemicals</li> </ul>	KI reacts with combined chlorine to produce triiodide, which reacts with DPD to produce Würster dye (red). It may take 2 to 3 minutes for the reaction to complete.	<ul style="list-style-type: none"> <li>• Use correct drop size</li> <li>• Do not use expired reagent</li> </ul>	<ul style="list-style-type: none"> <li>• Monochloramine reacts faster than dichloramine</li> <li>• Having more than 0.5 ppm of monochloramine will likely result in interference in step 3</li> </ul>
<b>5</b>	Make sure to rinse your test tube thoroughly to remove any leftover reagents. Cap the reagent bottles tightly and store them in a cool dark place to minimize degradation.				

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**FAS-DPD Titration Test**

Steps Taken	What is being introduced	What is happening	Things to remember	Other notes	
<b>0</b>	Make sure that your test tube has been thoroughly rinsed before you begin testing. Any small amount of the third reagent (iodide) leftover from the previous test will interfere with the free chlorine reading. It might be a good idea to have a test tube dedicated to free chlorine testing and another test tube dedicated to combined chlorine testing.				
<b>1</b>	Fill the test tube with sample water	<ul style="list-style-type: none"> <li>• Water</li> <li>• Free chlorine (if any)</li> <li>• Combined chlorine (if any)</li> </ul>	N/A	<ul style="list-style-type: none"> <li>• Take samples of representative water</li> <li>• Fill it to the correct amount</li> </ul>	<ul style="list-style-type: none"> <li>• Wrong amount of sample will skew the result</li> <li>• Hold it at your eye level</li> <li>• Be mindful of meniscus</li> </ul>
<b>2</b>	Add DPD powder (pH=N/A)	Might be different depending on manufacturer <ul style="list-style-type: none"> <li>• DPD</li> <li>• Phosphate</li> <li>• Other chemicals</li> </ul>	Conditioning the sample water and adding DPD at the same time. Free chlorine reacts with DPD to produce Würster dye.	<ul style="list-style-type: none"> <li>• Make sure each scoop is level (no less)</li> <li>• Do not use expired reagent</li> </ul>	<ul style="list-style-type: none"> <li>• Though it is recommended that each scoop is level, introducing a little more DPD power than recommended should not affect the result</li> </ul>
<b>3</b>	Add FAS titrant drop wise (pH=2.2)	Might be different depending on manufacturer <ul style="list-style-type: none"> <li>• Ferrous ammonium sulfate</li> <li>• Other chemicals</li> </ul>	FAS reacts with Würster dye to revert it to DPD to lose color.	<ul style="list-style-type: none"> <li>• It is extremely important that you are using correct drop size in this step</li> <li>• Do not use expired reagent</li> </ul>	<ul style="list-style-type: none"> <li>• Get the reading as quickly as possible</li> <li>• Waiting for more than a minute may result in monochloramine interference</li> <li>• Dilution is not required</li> </ul>
<b>4</b>	Add potassium iodide (pH=7.6)	Might be different depending on manufacturer <ul style="list-style-type: none"> <li>• Potassium iodide (KI)</li> <li>• Hydriodic acid</li> <li>• Other chemicals</li> </ul>	KI reacts with combined chlorine to produce tri-iodide, which reacts with DPD to produce Würster dye (red). It may take 2 to 3 minutes for the reaction to complete.	<ul style="list-style-type: none"> <li>• Use correct drop size</li> <li>• Do not use expired reagent</li> </ul>	<ul style="list-style-type: none"> <li>• Monochloramine reacts faster than dichloramine</li> <li>• Having more than 0.5 ppm of monochloramine will likely result in interference in step 3</li> </ul>
<b>5</b>	Repeat step 3. No need to hurry because it is for combined chlorine				
<b>6</b>	Make sure to rinse your test tube thoroughly to remove any leftover reagents. Cap the reagent bottles tightly and store them in a cool dark place to minimize degradation.				