REF 918 163

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Test 1-16$_3$ 07.15

NANOCOLOR® Chlorine dioxide

chlorine – chlorine dioxide – chlorite simultaneously

Method:
Photometric determination of chlorine components with *N*,*N*-diethyl-1,4-phenylene diamine (DPD)

Cuvette:	**50 mm**	**20 mm**	**10 mm**
Range (**mg/L ClO_2**):	**0.04–4.00**	**0.1–4.0**	**0.2–4.0**
Factor:	**02.07**	**005.2**	**010.4**
Wavelength (HW = 5–12 nm):	**540 nm**		
Reaction time:	**0 min**		
Reaction temperature:	**20–25 °C**		

Contents of reagent set:

100 mL Chlorine R1	50 mL Chlorine R4	1 measuring spoon 85 mm, black
20 g Chlorine R2	50 mL Chlorine R5	1 measuring spoon 85 mm, orange
25 g Chlorine R3	50 mL Chlorine R6	

Hazard warning:
Reagent R3 contains potassium iodide 25–100 %. For further information ask for a safety data sheet.

Interferences:
For a good reproducibility we recommend uninterrupted speedy work during sampling (prepare values A through D in parallel, measure sample with 25 mL measuring cylinder). To avoid errors, always use the same volumetric flasks for values A to D.

Procedure chlorine dioxide separately:
Pour into two separate volumetric flasks 25 mL:

Test sample	**Blank value**
20 mL test sample *(the pH value of the sample must be between pH 4 and 7)*	**20 mL** distilled water
1 mL Chlorine R4, mix	
1 mL Chlorine R1, mix	**1 mL** Chlorine R1, mix
1 black spoon Chlorine R2, mix	**1 black spoon** Chlorine R2, mix

Fill up test sample and blank value to 25 mL mark with distilled water, mix again and pour into cuvettes. Measure **immediately** the chlorine dioxide. Chlorine R3, R5 and R6 are not used for this procedure.

Procedure
chlorine – chlorine dioxide – chlorite
simultaneously:

Pour into five separate volumetric flasks 25 mL:

Blank value
20 mL distilled water
1 mL Chlorine R1, mix
1 black spoon Chlorine R2, mix

Value **A – chlorine dioxide**	Value **B – free chlorine**
1 mL Chlorine R4	
20 mL test sample *(the pH value of the sample must be between pH 4 and 7)*, mix	**20 mL** test sample *(the pH value of the sample must be between pH 4 and 7)*
1 mL Chlorine R1, mix	**1 mL** Chlorine R1, mix
1 black spoon Chlorine R2, mix	**1 black spoon** Chlorine R2, mix

Fill up test sample (value A and B) to 25 mL mark with distilled water, mix again and pour into cuvettes. Place **immediately** the cuvette with blank value into the photometer. Measurement of extinctions (value A and B).

Value **C – combined chlorine**	Value **D – chlorite**
20 mL test sample *(the pH value of the sample must be between pH 4 and 7)*	**1 mL** Chlorine R5
1 mL Chlorine R1, mix	**1 orange spoon** Chlorine R3
1 black spoon Chlorine R2, mix	**20 mL** test sample *(the pH value of the sample must be between pH 4 and 7)*, mix
1 orange spoon Chlorine R3, mix	wait **3 min**
wait **3 min**	**1 mL** Chlorine R6, mix
	1 black spoon Chlorine R2, mix

Fill up test sample (value C and D) to 25 mL mark with distilled water, mix again and pour into cuvettes. Measurement of extinctions (value C and D).

Measurement:
For *NANOCOLOR*® photometers see manual, test 1-16$_3$/1-16$_4$.

Photometers of other manufacturers:
Verify factors of evaluation for each type of instrument.

Evaluation (mg/L):

			Rectangular cuvette		
			50 mm	**20 mm**	**10 mm**
chlorine dioxide (ClO_2)	=	**A**	x 2.07	x 5.20	x 10.4
free chlorine (Cl_2)	=	**(B-A)**	x 1.09	x 2.72	x 5.4
combined chlorine (Cl_2)	=	**(C-B)**	x 1.09	x 2.72	x 5.4
chlorite (ClO_2^-)	=	**[D-(4A+C)]**	x 0.52	x 1.30	x 2.6

Note:
Chlorite is only present if value D > (4A+C). A negative result for chlorite means that no chlorite is present.

Disposal:
The contents of cuvettes and flasks can be washed into drain with plenty of water.

MACHEREY-NAGEL GmbH & Co. KG · Neumann-Neander-Str. 6–8 · 52355 Düren · Germany
Tel.: +49 24 21 969-0 · Fax: +49 24 21 969-199 · info@mn-net.com · ***www.mn-net.com***

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