REF 985050

Test 0-50 03.23
NANOCOLOR® organic Acids 3000
(fatty acids)

Method:
The determination of organic acids is carried out in two steps:
1. Esterification of organic acids with ethylene glycol
2. Conversion of the esters to hydroxamic acids which subsequently react with iron(III) ions to form red colored complexes

Range:	**30 – 3000 mg/L CH_3COOH**	**0.5 – 50.0 mmol/L CH_3COOH**
Wavelength (HW = 5 – 12 nm):	**470 nm**	
Esterification:	**10 min** at 100 °C	
Reaction time:	**3 min (180 s)** at 20 – 25 °C	

Contents of reagent set:

Box A: 20 test tubes organic Acids 3000
1 test tube with 11 mL organic Acids 3000 R2
1 bottle with 1.5 g organic Acids 3000 R3
1 measuring spoon 70 mm
1 test tube with blank value "NULL"

Box B: 1 bottle with 22 mL organic Acids 3000 R4
1 bottle with 45 mL organic Acids 3000 R5

Hazard warning:
Test tubes contain ethylene glycol 80 – 100 %, reagent R2 contains sulfuric acid 5 – 15 %, reagent R3 contains hydroxylammonium chloride 80 – 100 %, reagent R4 contains sodium hydroxide solution 5 – 20 %.
H314, H317, H351 Causes severe skin burns and eye damage. May cause an allergic skin reaction. Suspected of causing cancer.
P201, P202, P260, P261, P272, P280, P301+330+331, P302+352, P303+361+353, P304+340, P305+351+338, P308+313, P333+313, P363, P405, P501 Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe vapors. Avoid breathing dust. Contaminated work clothing should not be allowed out of the workplace. Wear protective gloves / eye protection. IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN: Wash with plenty of water / ... IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water / shower. IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF exposed or concerned: Get medical advice / attention. If skin irritation or rash occurs: Get medical advice / attention. Wash contaminated clothing before reuse. Store locked up. Dispose of contents / container to regulated waste treatment. For further information ask for a safety data sheet.

Interferences:
The concentration of acids can change rapidly by biochemical processes. Thus, solutions to be tested have to be examined directly after sampling.
Turbidities interfere and must be filtered prior to the test.
Digested sludge must be filtered (e.g. prefiltration using folded filters MN 617 we, REF 535018, fine filtration using membrane filters 0.45 µm, REF 91650; or filtration using CHROMAFIL® Xtra GF-100/25, REF 729228) or centrifuged.
The following ions will not interfere: < 20 g/L Cl^-; < 2000 mg/L SO_4^{2-}; < 1000 mg/L Ca^{2+} , Mg^{2+} ; < 250 mg/L NH_4^+ ; < 100 mg/L acetaldehyde, Cr(VI); < 50 mg/L CO_3^{2-}.
To circumvent interferences organic acids are separated by steam distillation before determination.

The method can be applied also for the analysis of the sea water.

Procedure:
Requisite accessories: piston pipette with tips, *NANOCOLOR*® heating block

1. Esterification	**100 °C / 10 min**
Switch on heating block, adjust to 100 °C, set timer to 30 min and start programme.	
Open test tube, add	
0.5 mL R2 and	
1.0 mL test sample *(the pH value of the sample must be between pH 3 and 10)*, close and mix.	
Place test tube in the **preheated** heating block for **exactly 10 min**.	
After 10 min remove test tube from heating block and **cool immediately** under running water.	

2. Analysis
Open test tube again, add
1 spoon R3, close and mix. Add
1.0 mL R4, close and mix. Add
2.0 mL R5, close and mix.
Clean outside of test tube and measure after 3 min.

Measurement:
For *NANOCOLOR*® photometers and PF-12 see manual, test 0-50.

Measurement when samples are colored or turbid:
For all *NANOCOLOR*® photometers see manual, use key for correction value.

Photometers of other manufacturers:
For other photometers check whether measurement of round glass tubes is possible. Verify factor for each type of instrument by measuring standard solutions.

References:
German standard methods for the examination of water, waste water and sludge (DIN EN 38414-S19)
B. H. C. Montgomery, J. F. Dymock, N. S. Thom, The Analyst, 87, 949 – 955 (1962)

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