

APC350
Phosphorus total
MR 2 – 20 mg/L PO₄-P / 6 – 60 mg/L PO₄

DOC312.53.94349

Principle

Phosphate ions react with molybdate and antimony ions in an acidic solution to form an antimonyl phosphomolybdate complex, which is reduced by ascorbic acid to phosphormolybdenum blue

Range of Application

Waste water, drinking water, boiler water, surface water, process analysis

Interferences

T1
5000 mg/l: SO ₄ ²⁻
2000 mg/l: Cl ⁻
1000 mg/l: K ⁺ , Na ⁺ , Ca ²⁺
500 mg/l: Mg ²⁺ , NO ₃ ⁻
50 mg/l: Co ²⁺ , Fe ²⁺ , Fe ³⁺ , Zn ²⁺ , Cu ²⁺ , Ni ²⁺ , I ⁻ , NO ₂ ⁻ , Cd ²⁺ , Sn ⁴⁺ , NH ₄ ⁺ , Mn ²⁺ , Al ³⁺ , Hg ²⁺ , Pb ²⁺ , SiO ₂
25 mg/l: Ag ⁺
10 mg/l: Cr ³⁺
5 mg/l: Cr ⁶⁺

The ions listed in T1 have been individually checked up to the given concentrations and do not cause interference. We have not determined cumulative effects and the influence of other ions. The measurement results must be subjected to plausibility checks (dilute and/or spike the sample).

Sample Volume	0,4 mL
Reagent B Volume	0,5 mL
Reagent C Volume	0,2 mL
Reagent B Filling	60 mL
Reagent C Filling	30 mL
Reagent D Filling	12 g
Digestion Temperature/Time	120°C/30 min. or 110°C/60 min.
Temperature Sample/sample cuvette	15 – 25°C
pH sample	2 – 10

AP3900 multi with HT-Module can also use:

Digestion Temperature/Time **170°C/15 min.**

Please note:

With AP3900 Software Version 1.0.7.5 or higher a digestion temperature of 120°C is possible to be chosen.

So the tests for TP (APC348 / APC349 / APC350) can be run at 120°C/30 min. to save time and to have identical time and temperature as manual handling with LCK348 / LCK349 / LCK350.

There is no change in the quality of the results by switching from 110°C/60 min. to 120°C/30min. procedure. There is no calibration update needed.

Method Library:

APC350 total is pre-programmed in the method library. Please check under Settings/Software/Application/Methods **Phosphate** and Tests **APC350**.

Settings

General Methods/Tests QC/Blanks Reagents trays Colors Remote messaging Other parameters

Sample profiles Methods Tests Other parameters

Methods definitions:

- Ammonium
- Chloride
- COD
- COD high
- Formaldehyde
- ISO-COD
- LCA722
- LCA722_Reagent
- LCK Ammonium
- Nitrate
- Nitrite
- Orthophosphate
- Phenol
- Phosphate**
- Reagent Volume
- Sample Volume
- TNb

Reading 1 (Concentration):

Low-range test: APC349 Underrange: 0.050 Overage: 1.500

Middle-range test: APC348 Underrange: 0.500 Overage: 5.000

High range test: APC350 Underrange: 2.000 Overage: 20.000

Redo samples with underrange error if possible.

Redo samples with overrange error if possible.

-> High-range cuvette overrange dilution factor: 2

Use default samplevolume if sample is diluted for the test before using lower range test.

Redo samples with other error (barcode/absorption error).

Method priority level: 5

Stir sample in samplecup by default.

Always clean/flush needle after aspirating/dispensing sample.

Waiting time after start processing cuvet before starting processing next cuvet of test: 0 sec.

Add Method

Delete Method

OK

Cancel

Example: Setting 120°C / 30 min.

Settings

General Methods/Tests QC/Blanks/Second-Ids Reagents trays Colors Remote messaging Other parameters

Sample profiles Methods Tests Other parameters

Tests definitions:

- Add sample to cuvette Volume (µl): 400 Speed (µl/s): 500 500 Sampling Z-offset (mm): -1
- Rotate cap of cuvette
- Shake cuvette vertical Time (sec): 5 Speed (%): 40
- Heat cuvette in heater Time (min): 30 Temperature: 120 °C Priority: Normal
- (Cooling) delay cuvette Time (min): 20 Priority: Normal
- Add reagent to cuvette Volume (µl): 500 Speed (µl/s): 400 400 Reagent: B 348/349/350
- Add reagent to cuvette Volume (µl): 200 Speed (µl/s): 400 400 Reagent: C 348/349/350
- Shake cuvette by inversion Time (sec): 10 Speed inv. (%): 50 Speed rot. (%): 50
- (Cooling) delay cuvette Time (min): 10 Priority: Normal
- Measure cuvette
- None
- None
- None
- None
- None
- None

Blank measurement needed for test. Only measure blank.

Re-create blank if re-measurement is needed for test.

Final capping overload (0-99%): 40

Use reaction-cuvette.

Blank extinction: 0 mE. Use nominal blank absorbance if out of range.

Blank tolerance: 0 mE. Nominal absorbance factor: 0.00

Add test

Delete test

OK

Cancel

Note

The APC350 total needs a preparation of Reagent C:

Use the delivered spoon and take 2 spoonful of Reagent D into Solution C. Invert it for approximately 30 seconds (until it's solved). This solution is stable for 5 days at room temperature.

Alternative with AP3900 Multi with HT-Module:

Settings

General | Methods/Tests | QC/Blanks/Second-IDs | Reagents trays | Colors | Remote messaging | Other parameters

Sample profiles | Methods | Tests | Other parameters

Tests definitions:

1.	Add sample to cuvette	Volume (µl):	400	Speed (µl/s):	500	500	Sampling Z-offset (mm):	-1
2.	Rotate cap of cuvette							
3.	Shake cuvette vertical	Time (sec):	5	Speed (%):	40			
4.	Heat cuvette in HT-Unit	Time (min):	15	HT Temperature:	170		Priority:	Normal
5.	(Cooling) delay cuvette	Time (min):	20				Priority:	Normal
6.	Add reagent to cuvette	Volume (µl):	500	Speed (µl/s):	400	400	Reagent:	B 348/349/350
7.	Add reagent to cuvette	Volume (µl):	200	Speed (µl/s):	400	400	Reagent:	C 348/349/350
8.	Shake cuvette by inversion	Time (sec):	10	Speed inv. (%):	50		Speed rot. (%):	50
9.	(Cooling) delay cuvette	Time (min):	10				Priority:	Normal
10.	Measure cuvette							
11.	None							
12.	None							
13.	None							
14.	None							
15.	None							

Blank measurement needed for test. Only measure blank.
 Re-create blank if re-measurement is needed for test. Final capping overload (0-99%): 40
 Use reaction-cuvette:
 Blank extinction: 0 mE. Use nominal blank absorbance if out of range.
 Blank tolerance: 0 mE. Nominal absorbance factor: 0.00

Run the APC350 total Phosphorous method

Create a Run like described in the QUICK GUIDE

- Place the APC350 cuvettes according to the settings in the Software in the cuvette racks.
- Place the samples according to the settings in the Software in the sample racks
- Place the Reagent B and C according to the settings in the Reagent trays

Settings

General | Methods/Tests | AQC/Blanks | Reagents trays

Tray 1 (Left):

Position	Name	Volume	Re-filled
Position 1:	A 339	50.00	<input checked="" type="checkbox"/>
Position 2:	A 340	5.20	<input type="checkbox"/>
Position 3:		0.00	<input type="checkbox"/>
Position 4:		0.00	<input type="checkbox"/>
Position 5:	B 348/349/350	27.00	<input type="checkbox"/>
Position 6:	C 348/349/350	29.60	<input type="checkbox"/>

Volume in reagents cup:
 Volume in filled reagents cup: 50 mL
 Warning level reagents cup: 5 mL

Other liquid level settings:
 dZ Tray definition -> Max. Liquid level: 300
 dZ 10th of mm -> mL: 12

- Check if fresh and enough pipette tips are available
- Check if enough Rinsing/Dilution water is available
- Initialize the AP 3900 multi and the Dispenser



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