LCK348 Phosphorus total / Phosphate ortho

DOC312.53.94020

Method

0.5–5.0 mg/L PO_4-P, 1.5–15.0 mg/L PO_4 or 1.2–11.5 mg/L P_2O_5 **LCK348**

Scope and application: For wastewater, drinking water, boiler water, surface water and process analysis.

Test preparation

Test storage

Storage temperature: 15–25 °C (59–77 °F)

pH/Temperature

The pH of the water sample must be between pH 2–10.

The temperature of the water sample and reagents must be between 15–25 °C (59–77 °F).

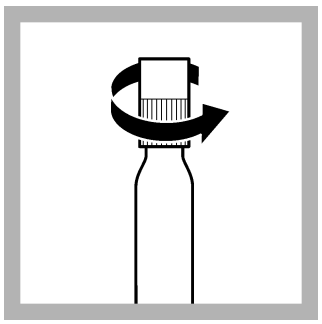
Before starting

ATTENTION—Important information for the evaluation!
Without hydrolysis, only the (dissolved) orthophosphate is measured. The result of the orthophosphate measurement can be expressed as: mg/L PO_4-P (e.g., process analysis), mg/L PO_4 (e.g., drinking water or boiler water analysis), mg/L P_2O_5 (e.g., soil analysis).
With hydrolysis, all of the phosphorus (Total-P, P_{total}) is measured. The result of the total phosphorus measurement can be expressed as: mg/L P_{tot} = Display mg/L PO_4-P (e.g., for monitoring threshold values in wastewater), mg/L PO_4 (e.g., drinking water or boiler water analysis), mg/L P_2O_5 (e.g., soil analysis).
Inverting the cuvette after hydrolysis improves the reliability of the result.
Determination of orthophosphate: filtrate the sample before the analysis.
In case of not working at the correct recommended temperature an incorrect result may be obtained.
Review safety information and expiration date on the package.
Review the Safety Data Sheets (MSDS/SDS) for the chemicals that are used. Use the recommended personal protective equipment.
Dispose of reacted solutions according to local, state and federal regulations. Refer to the Safety Data Sheets for disposal information for unused reagents. Refer to the environmental, health and safety staff for your facility and/or local regulatory agencies for further disposal information.

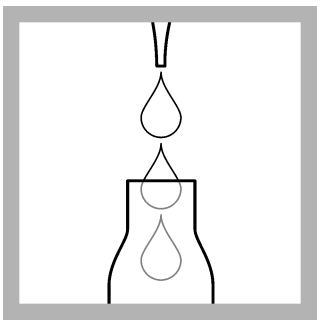
Procedure total phosphorus



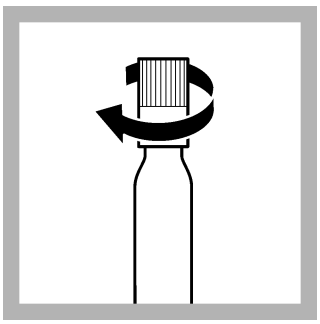
1. Carefully remove the foil from the screwed-on DosiCap Zip.



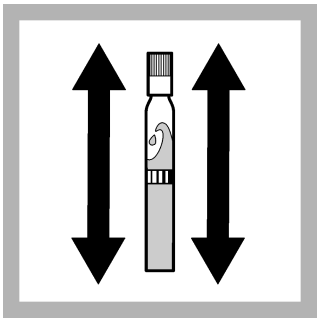
2. Unscrew the DosiCap Zip.



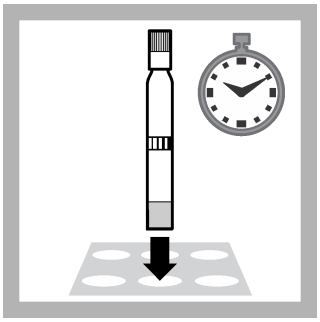
3. Carefully pipet **0.5 mL** of **sample**.



4. Immediately screw the DosiCap Zip back on **tight**; **fluting at the top**.



5. Shake **vigorously**.

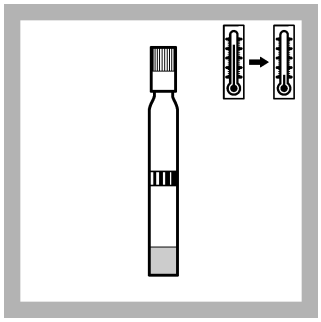


6. Heat in the thermostat.
HT200S: in the standard program HT for **15 minutes**.

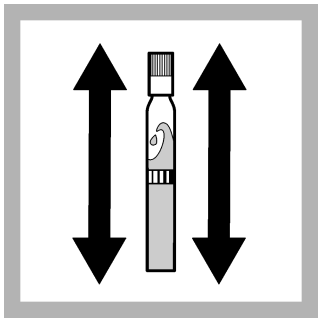
Thermostat:

for **60 minutes** at **100° C (212° F)** or

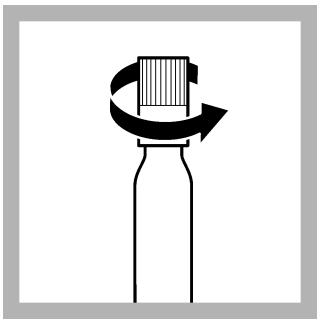
for **30 minutes** at **120° C (248° F)**.



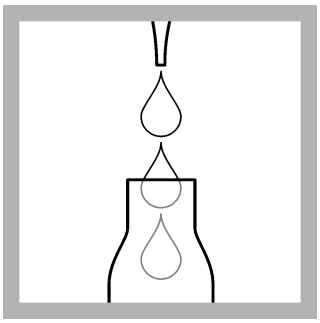
7. Allow to **cool** to room temperature.
NOTE: Check if the **cap is still tight** after cooling.



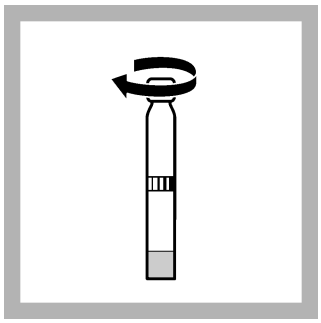
8. Shake **vigorously**.



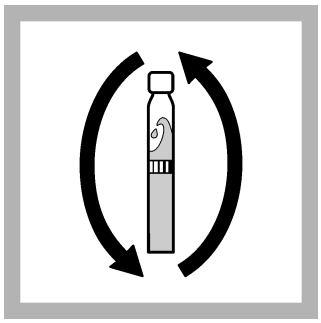
9. Unscrew the DosiCap Zip.



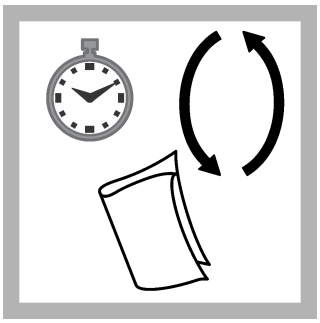
10. Pipet into the cooled cuvette: **0.2 mL** of **Reagent B**. Close Reagent B **immediately** after use.



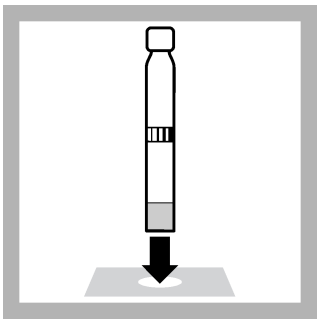
11. Screw a grey **DosiCap C** on the cuvette.



12. Invert a few times until the freeze-dried contents are **completely dissolved**.

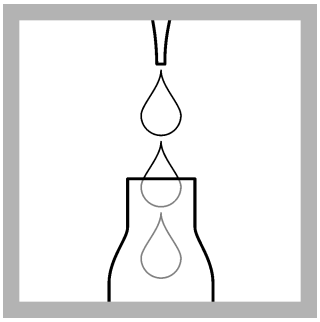


13. After **10 minutes**, invert a few more times, thoroughly clean the outside of the cuvette and evaluate.

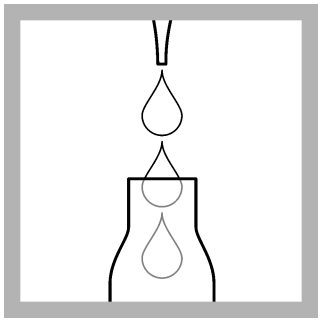


14. Insert the cuvette into the cell holder.
DR1900: Go to LCK/TNTplus methods.
Select the test, push **READ**.

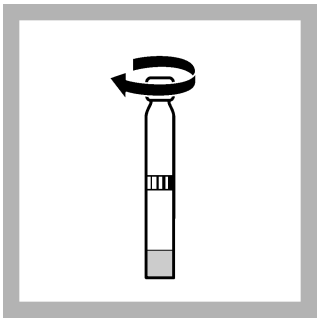
Procedure orthophosphate



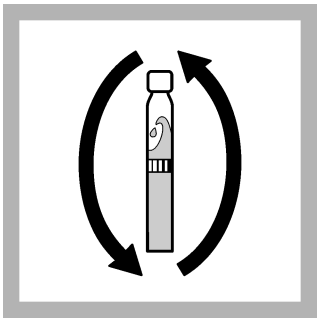
1. Carefully pipet **0.5 mL sample**.



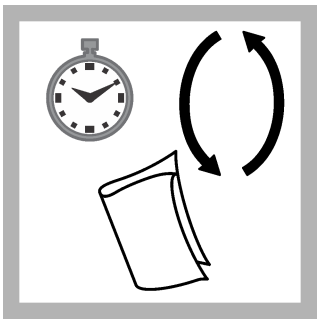
2. Pipet **0.2 mL Reagent B**. Close Reagent B **immediately** after use.



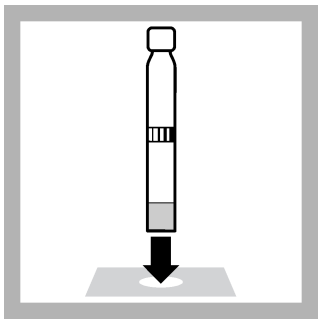
3. Screw a grey **DosiCap C** on the cuvette.



4. Invert a few times until the freeze-dried contents are **completely dissolved**.



5. After **10 minutes**, invert a few more times, thoroughly clean the outside of the cuvette and evaluate.



6. Insert the cuvette into the cell holder.
DR1900: Go to LCK/TNTplus methods. Select the test, push **READ**.

Interferences

The ions listed in the table have been individually checked against the given concentrations and do not cause interference. The cumulative effects and the influence of other ions have not been determined.

The measurement results must be subjected to plausibility checks (dilute and/or spike the sample).

Removal of interferences

If phosphonic acids are present the time for hydrolysis in the thermostat must be increased to 2 hours at 100°C in order to prevent low-bias results (refer to the determination of total phosphorus procedure).

Interference level	Interfering substance
20000 mg/L	SO_4^{2-}
10000 mg/L	Cl^-
4000 mg/L	K^+, Na^+
1000 mg/L	Ca^{2+}
500 mg/L	NO_3^-
400 mg/L	Mg^{2+}
200 mg/L	Co^{2+}, Fe^{2+}, Fe^{3+}, Zn^{2+}, Cu^{2+}, Ni^{2+}, NO_2^-, Cd^{2+}, NH_4^+, Mn^{2+}, Al^{3+}, CO_3^{2-}
100 mg/L	I^-
50 mg/L	SiO_2

Interference level	Interfering substance
40 mg/L	Hg^{2+}
20 mg/L	Pb^{2+}
10 mg/L	Ag^{+}, Sn^{4+}
5 mg/L	Cr^{3+}
1 mg/L	Cr^{6+}

Summary of method

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

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