TNT844 Phosphorus, Reactive (Orthophosphate) and Total

0.5–5.0 mg/L PO_4–P or 1.5–15.0 mg/L PO_4 High Range

TNTplus®844—Method 10209/10210

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

Test preparation

Reagent storage

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

pH/Temperature

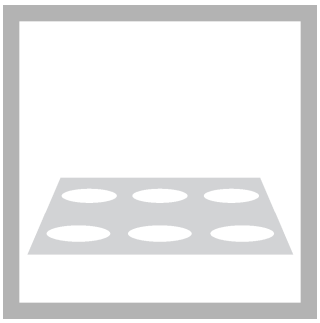
The pH of the water sample must be between pH 2–10.

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

Before starting

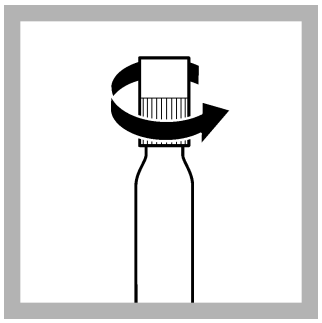
ATTENTION—Important information for the evaluation!
Without hydrolysis, only the (dissolved) orthophosphate is measured. The result of the orthophosphate measurement can be expressed as: mg/L PO_4-P (for example, process analysis), mg/L PO_4 (for example, drinking water or boiler water analysis), mg/L P_2O_5 (for example, soil analysis).
With hydrolysis, all of the phosphorus (Total-P, Ptotal) is measured. The result of the total phosphorus measurement can be expressed as: mg/L Ptot = Display mg/L PO_4-P (for example, for monitoring threshold values in wastewater), mg/L PO_4 (for example, drinking water or boiler water analysis), mg/L P_2O_5 (for example, soil analysis).
Inverting the vial 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—Phosphorus Total

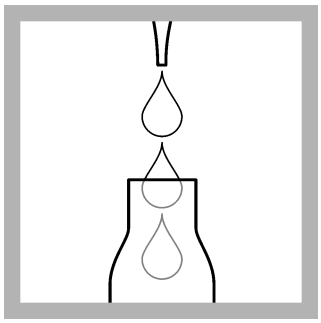


1. Preheat the reactor to **100° C (212° F)** or to **120 °C (248 °F)**.

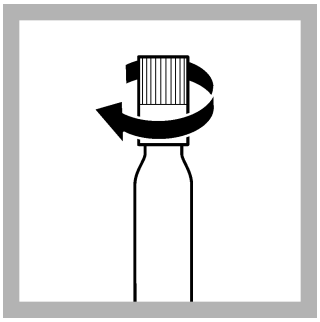
2. Carefully remove the foil from the screwed-on **DosiCap Zip A**.



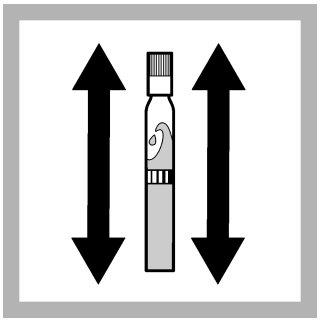
3. Unscrew the **DosiCap Zip A**.



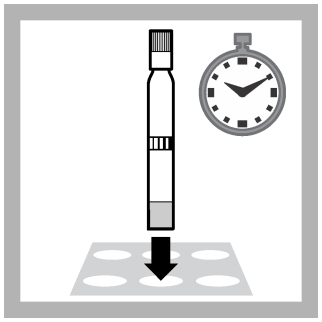
4. Carefully pipet **0.5 mL** of **sample**.



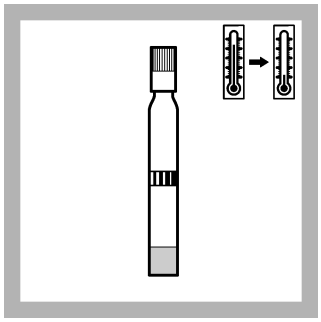
5. Immediately screw the **DosiCap Zip A** back on **tight**; **fluting at the top**.



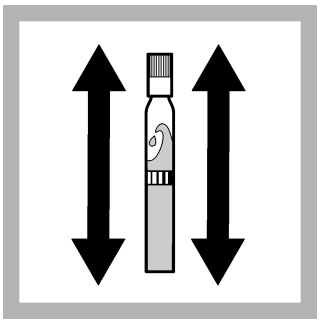
6. Shake **vigorously 2–3 x**.



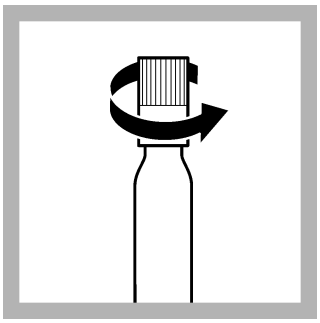
7. Heat in the reactor for **60 minutes** at **100° C (212°F)** or for **30 minutes** at **120 °C (248 °F)**.



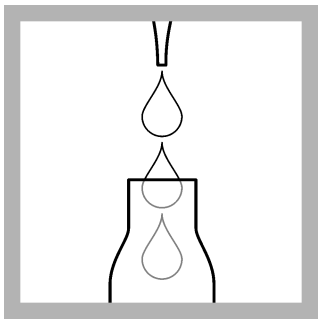
8. Allow to **cool** to room temperature.



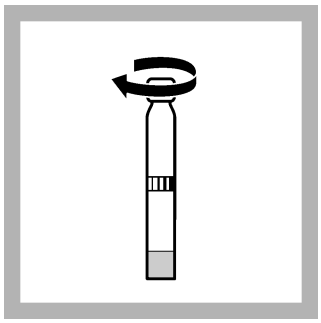
9. Shake **vigorously 2–3 x**.



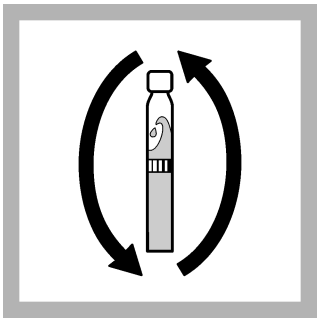
10. Unscrew the **DosiCap Zip A**.



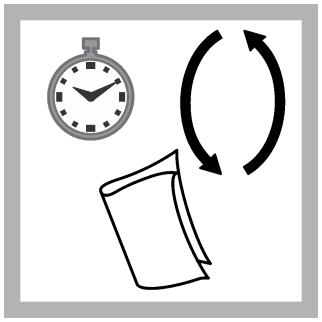
11. Pipet into the cooled vial: **0.2 mL** of **reagent B**. Close **reagent B** immediately after use.



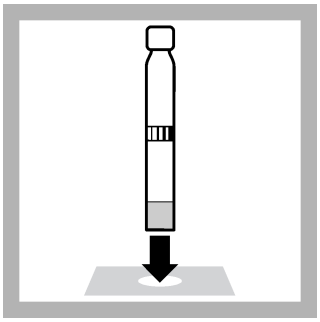
12. Screw a **grey** colored **DosiCap C** on the vial.



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

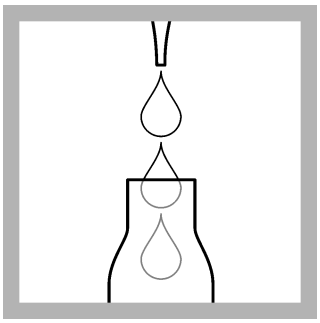


14. After **10 minutes**, invert a few more times, thoroughly clean the outside of the vial and evaluate.

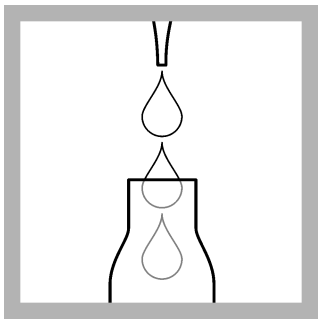


15. Insert the vial into the cell holder.
DR1900: Go to LCK/TNTplus methods.
Select the test, push **READ**.

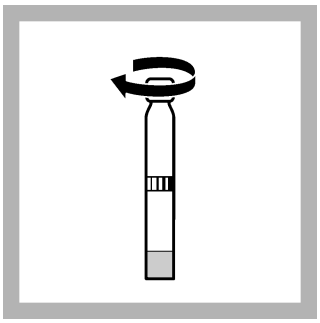
Procedure—Phosphorus Reactive (Orthophosphate)



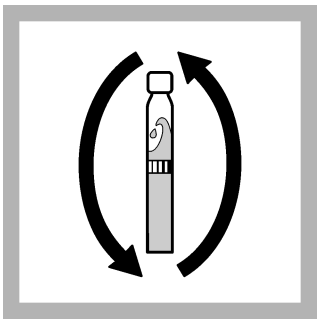
1. Carefully pipet **0.5 mL** of **sample**.



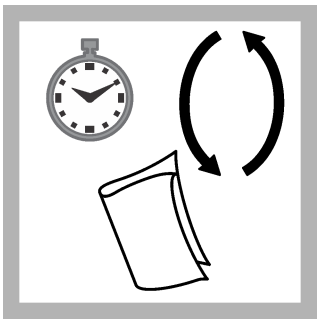
2. Pipet **0.2 mL** of **reagent B**. Close **reagent B** immediately after use.



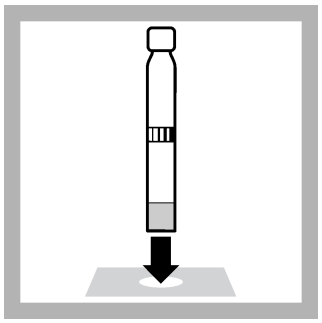
3. Screw a **grey** colored **DosiCap C** on the vial.



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 vial and evaluate.



6. Insert the vial 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).

Interference level	Interfering substance
20 g/L	SO_4^{2-}
10 g/L	Cl^-
4 g/L	K^+, Na^+
1 g/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
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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