

TNT 817

International Bitterness Units

DOC312.53.94121

2 to 300 IBU

TNTplus® 817—Method 10288

Scope and application: For beer and wort.



Test preparation

Reagent storage

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

Items to collect

Description	Quantity
1-cm quartz-glass cell	1
Pasteur pipet (150 mm) with suction pipet	1

Before starting

Clean the quartz-glass vial thoroughly after each series of measurements. First, clean the quartz-glass vial with alcohol (isopropyl or pure ethanol), second, clean with plenty of water, third, clean with more alcohol and allow to air-dry. For sample batches with widely varying bitter units, it is recommended to clean the quartz-glass vial between samples with iso-octane.

UV-active substances can cause inconclusive findings. These substances include, among others, plasticisers. The iso-octane phase must be transferred to the quartz-glass vial using a glass pipet. When transferring the iso-octane, make sure that no iso-octane gets into the suction pipet.

Absolute absorption levels are measured when determining the bitter units. This means that any fluctuations between different devices and/or vials and changes in the iso-octane quality have a direct impact on the measurement result. Therefore, a unique zero value must be set on the photometer for each series of measurements. The same quartz-glass vial must be used for determining the zero value and measuring the sample.

Any samples containing carbon dioxide must be degassed before analysis (e.g., stir with a magnetic stirrer); Do not filter the samples, as the foam will also contain bitter substances. Clear the wort and cloudy beer by means of a centrifuge prior to analysis.

Before taking a series of measurements, the zero value must be set one time on the photometer.

Several samples can be handled in parallel.

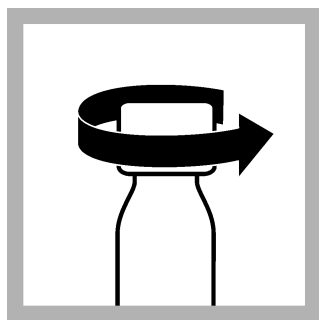
This method is applicable on DR5000/DR6000 only.

Review safety information and expiration date on the package.

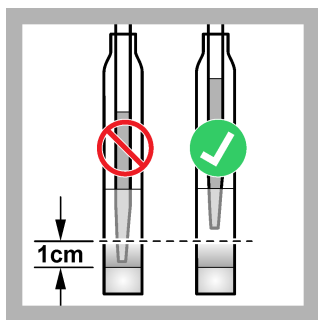
Review the Safety Data Sheets (MSDS/SDS) for the chemicals that are used. Use the recommended personal protective equipment.

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.

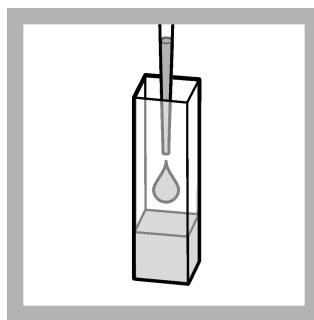
Procedure



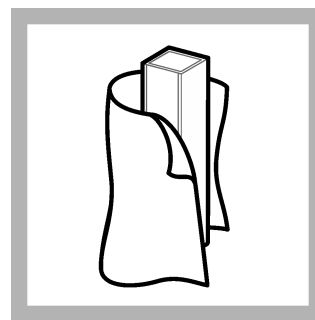
1. Remove the cap from the TNTplus® vial.



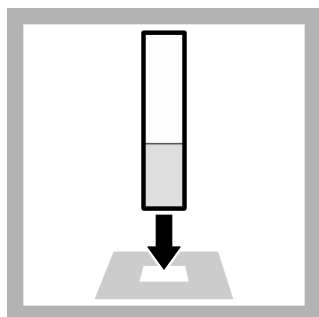
2. **Prepare the blank:** Remove most of the iso-octane phase (top layer) from the vial with a pasteur pipet. Keep a minimum of 1 cm of the iso-octane phase in the vial.



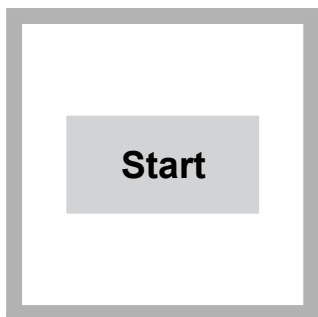
3. Put the iso-octane phase in a clean 1-cm quartz sample cell.



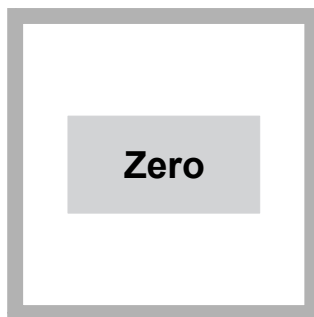
4. Clean the sample cell.



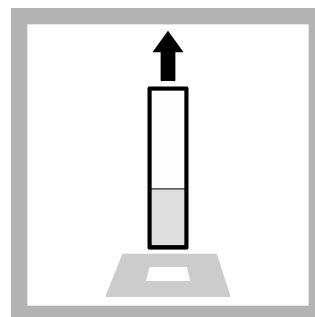
5. Insert the sample cell into the cell holder.



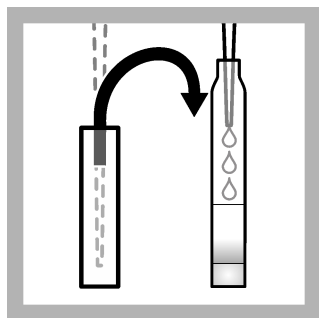
6. **DR 5000/DR 6000:** Go to Stored programs. Select program **817**.



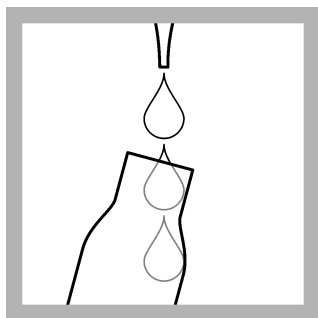
7. Push **ZERO**.



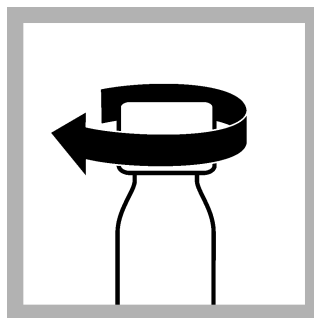
8. Remove the sample cell from the cell holder.



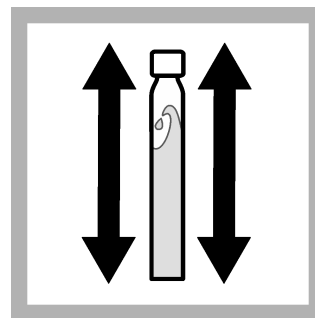
9. Remove all of the iso-octane phase from the sample cell with a pasteur pipet. Put the iso-octane phase in the TNTplus® vial.



10. **Prepare the sample:** Add 1 mL of sample slowly along the length of the vial inner wall with a pipet.



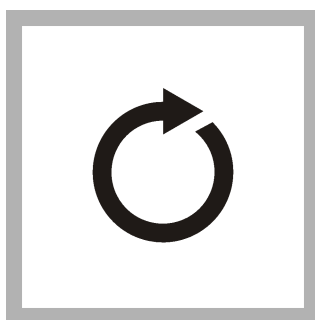
11. Put the cap on the vial.



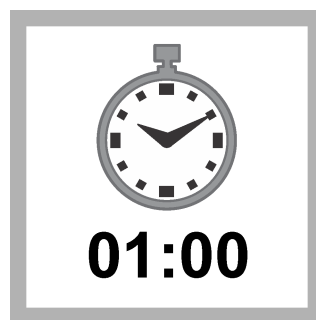
12. Shake the vial vigorously for 10 seconds.



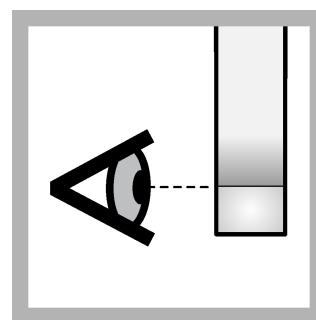
13. Do not move the vial for 20 seconds.



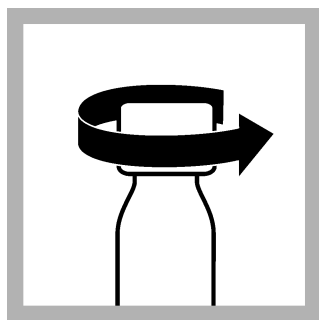
14. Do steps 12 and 13 two more times.



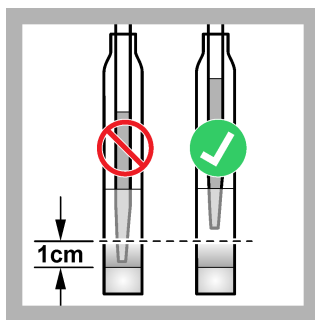
15. Do not move the vial for 1 minute.



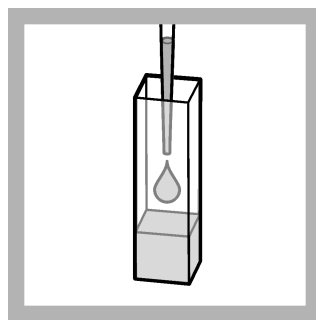
16. Make sure that the two phases (layers) are divided.



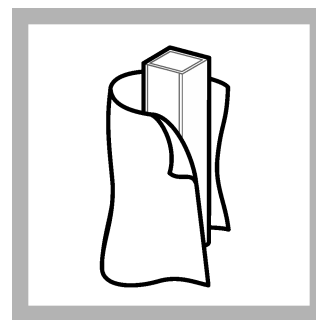
17. Remove the cap from the TNTplus[®] vial.



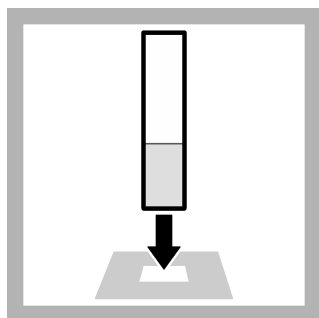
18. Remove most of the iso-octane phase (top layer) from the vial with a pasteur pipet. Keep a minimum of **1 cm** of the iso-octane phase in the vial.



19. Put the iso-octane phase in the 1-cm quartz sample cell.



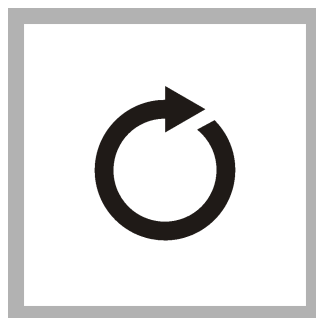
20. Clean the sample cell.



21. Insert the sample cell into the cell holder.



22. Push **READ**.



23. Do steps 10–22 with a new TNTplus[®] vial to measure the next sample.
For samples with largely different bitter units, clean the quartz sample cell between samples with iso-octane.

Summary of method

The bitter substances or recyclable materials in hops—primarily iso- α -acids—are extracted from the acidified sample with iso-octane. The concentration contained in the iso-octane extract is measured spectrophotometrically.

TNTplus[®]



FOR TECHNICAL ASSISTANCE, PRICE INFORMATION AND ORDERING:

In the U.S.A. – Call toll-free 800-227-4224

Outside the U.S.A. – Contact the HACH office or distributor serving you.

On the Worldwide Web – www.hach.com; E-mail – techhelp@hach.com

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