

# Measuring "LAS" Based Surfactants with Hach Barcode Cuvette Test TNTPlus 874

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## Introduction

Anionic surfactants like linear alkyl sulfonates (LAS) react with methylene blue to form complexes, which are extracted in chloroform and evaluated photometrically. Anionic surfactants are a heterogeneous mixture of single components and are reported as sum parameter. Ideally, the calibration of the test is done with the same mixture as to be measured in the samples.

The Hach® TNTPlus™ cuvette test TNT874 is calibrated with a single pure component, sodium-dodecylbenzenesulfonate (SDBS), with a linear chain of 12 carbon atoms and a molecular weight of 348.48 g/mol. The LAS standards are a mixture of different compounds with linear chains of 10-16 carbon atoms and a molecular mass of 320.43 g/mol.

A cuvette test like TNT874, calibrated with SDBS, must be adapted if results are to be reported as mg/L LAS. This application note describes the adapted calibration curve and includes instruction for programming this curve into a DR spectrophotometer.

## Material Used

The adapted LAS calibration was created with the following items:

- Standard solution, detergent, 60 mg/L as LAS, pk/16-10 mL Voluette® ampules (Item number 1427110)
- Cuvette test TNTPlus 874
- DR spectrophotometers DR6000, DR3900, DR3800, DR5000, and DR1900



## Results

The calibration of DR spectrophotometers using cuvette test TNT 874 and the HACH LAS standard formulation results in a linear five-point calibration curve (see Figure 1). The instrument is zeroed against air.

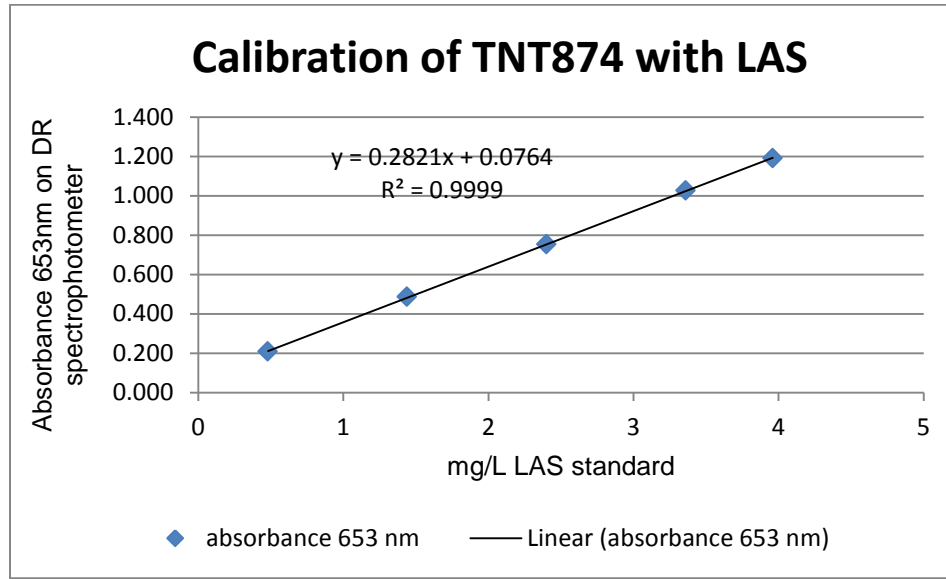
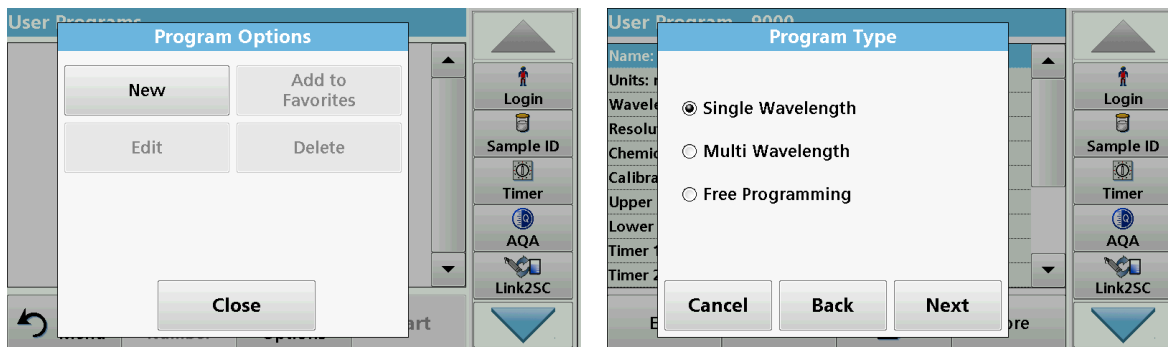


Figure 1: Calibration of TNT874 with LAS

The calibration formula is given by:  
 Conc. mg/L LAS = abs. 653 nm \* 3.54 – 0.26 (zero against air)

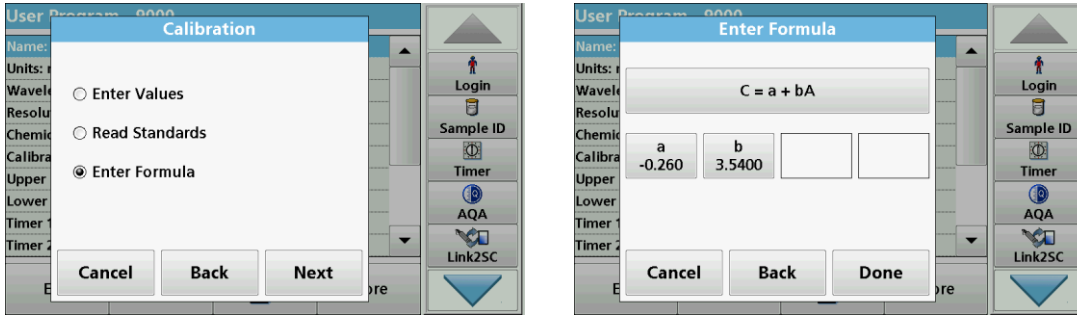
## Programming of the Procedure

Program the adapted curve into a DR spectrophotometer (example below is with the DR3900):

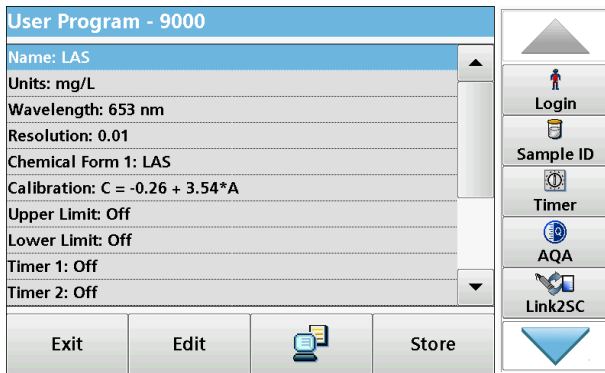


From Main Menu go to User Programs  
 → Program Options → New

Select Units: **mg/L**  
 Select Wavelength: **653 nm**  
 Select Resolution **0.01**  
 Select Chemical Form: **LAS**  
 Select Program Type: **Single Wavelength**

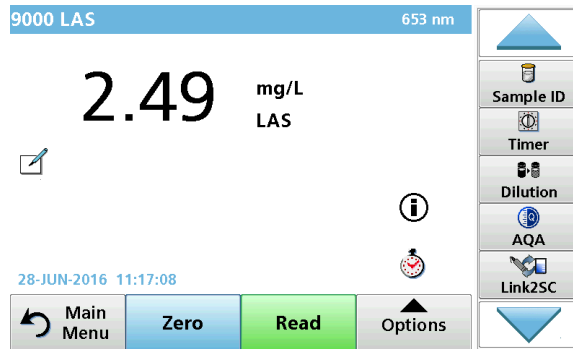
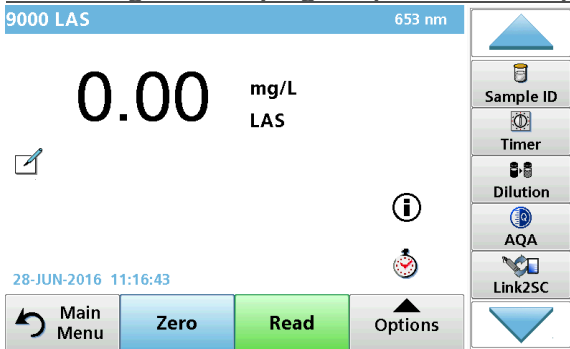


Choose the **Calibration** format **Enter Formula** → and type in **-0.26** for A and **3.54** for B → Press **Done**



Finish: The program overview should look like above image and can be stored by pressing **Store**.  
If needed, you can add lower (0.1 mg/L LAS) and upper limit (4.0 mg/L LAS)

**Performing the User program (here: 9000 LAS)**



From the **Main Menu** go to **User Programs** and select the test (here: **9000 LAS**) →  
Press **ZERO** and zero against air with empty Cell compartment  
ZERO measurement is displayed

Prepare sample and put sample vial in →  
Press **READ** →  
The result is displayed as mg/L LAS

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