



Application Note AN-T-055

Determination of Lauryl Sulfate

Fast and reliable determination by turbidimetric titration

Due to its price and wide availability, the anionic surfactant sodium lauryl sulfate (SLS; SDS) can be found in many detergents as an active ingredient e.g., in cleaning or cosmetic products. SLS is mainly added to these products to act as an emulsifier or as a fat solvent. The fact that it dissolves fats very well may lead to dry skin and hair, and thus to skin irritation. To avoid this, regulations in many countries have restricted its concentration in ready-to-use products to a range between 0.05–2.5% SLS.

To control the concentration of SLS in different products, a titration is carried out with TEGO® trant A100. This cationic surfactant was designed especially for the titration of anionic surfactants, and precipitates uniformly with them.

The turbidimetric titration monitors the degree of turbidity using the Optrode. The evaluation is done automatically by means of a software, leading to reliable and reproducible results.

SAMPLE AND SAMPLE PREPARATION

The analysis is demonstrated on hand soap containing SLS. No sample preparation is

required.

EXPERIMENTAL

The analysis is carried out fully automatically on a Titrand system consisting of a 905 Titrand and an Optrode (**Figure 1**).

The sample is transferred into a sample beaker and buffer (pH = 3) is added. The obtained solution is filled up with deionized water to a total volume of approximately 60 mL and titrated with standardized TEGO® trant A100 until after the second break point.



Figure 1. Titrand system consisting of a 905 Titrand, an Optrode, and tiamo for data processing.

RESULTS

Reproducible titration curves (see **Figure 2**) are obtained for all analyses. For calculation purposes, the second break point was used because this point correlates to the stage in

titration where no more precipitation is formed. With the automated analysis described here, a SLS content of 26.7 mmol/100 g (SD(rel) = 1.2%, n = 3) is obtained for the tested hand soap.

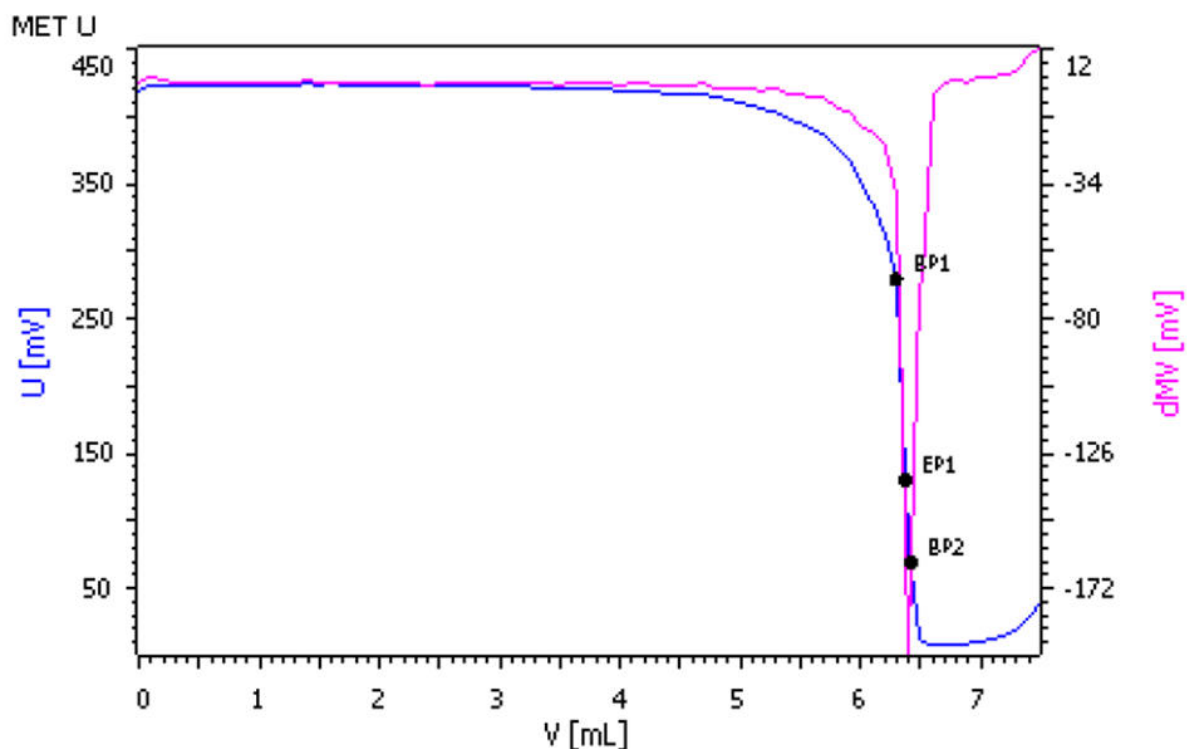


Figure 2. Titration curve of the determination of SLS with TEGO® trant A100. The titration curve shows the EP as well as BP1 and BP2. BP2 is used for the calculation.

CONCLUSION

The described system has the capability to objectively determine the change in turbidity. This leads to more precise and more reproducible results compared to manual

titration. With its glass shaft, the Optrode is insensitive to solvents and can also be used at different wavelengths for other applications.

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CONFIGURATION



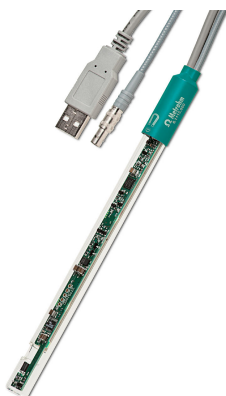
OMNIS Advanced Titrator

创新型、模块式电位分析 OMNIS Titrator 滴定仪,适于独立运行或作为 OMNIS 滴定系统的核心元件运行,用于使用 OMNIS Sample Robot 进行终点和等当点滴定(单一/动态)。由于采用 3S 试剂瓶适配器技术,处理化学品很安全。可以使用测量模块和计量管单元自由配置滴定仪,并在需要时扩展一台螺旋搅拌器。在需要时可以通过相应的软件功能许可证为平行滴定升级 OMNIS Advanced Titrator。

- 通过计算机或本地网络控制
- 可以为其他应用或辅助溶液另外连接四个滴定模块或加液模块
- 螺旋搅拌器的连接方式
- 可提供不同大小的计量管:5、10、20 或 50 mL
- 采用 3S 技术的试剂瓶适配器:安全处理化学品,自动传输生产商的原始试剂数据

测量模式和软件选项:

- 终点设定滴定:“Basic” 功能许可证
- 终点和等当点滴定(单一/动态):“Advanced” 功能许可证
- 终点和等当点滴定(单一/动态),包括平行滴定:“Professional” 功能许可证



Optrode

有 8 种可用波长的光度滴定用光学传感器。可以通过软件控制(tiamo 2.5 及以上版本)或通过磁铁来进行波长切换。该玻璃鞘对溶剂耐受,并且易于清洁。这种节省空间的传感器适用于,例如:

- 按照 USP 或 EP 的非水溶性滴定
- 羧基端基的测定
- TAN/TBN 根据 ASTM D974
- 硫酸测定
- 混凝土中的 Fe、Al、Ca
- 水硬度
- 根据 USP 的硫酸软骨素

传感器不适合通过测量颜色强度(比色法)来测定浓度。