



Application Note AN-T-090

硫酸锌的测定

Photometric analysis according Ph.Eur. and USP

The inorganic compound zinc sulfate is used for various applications. It is often utilized as a dietary supplement to nourish both humans and animals with zinc, an essential mineral for our health, since we cannot produce nor store it naturally. Zinc is also often used in medicine because of its antibacterial properties. Additionally, it can be applied on roofs to prevent extended moss growth, used as precursor of the white pigment «lithopone», or

in zinc electroplating. Due to its versatile applications, the determination of its purity is important.

This Application Note describes the photometric determination of zinc sulfate using the Optrode at a wavelength of 610 nm. Complexometric titration of zinc requires EDTA as titrant and Eriochrome Black T as indicator. The method fully complies with Ph. Eur. and USP.

SAMPLE AND SAMPLE PREPARATION

The analysis is demonstrated on a zinc sulfate heptahydrate sample. No sample preparation is

required.

EXPERIMENTAL

An appropriate amount of sample is weighed into a beaker and is dissolved in deionized water. Ammonia buffer pH 10 and a small amount of Eriochrome Black T indicator is then added to the beaker. The sample is titrated photometrically with standardized EDTA until after the break point.



Figure 1. 907 Titrand with tiamo. Exemplary setup for the photometric determination of zinc sulfate purity.

RESULTS

The analysis demonstrates a distinct color change which results in reliable and reproducible results. In this study, the zinc

sulfate content was determined as $w(\text{ZnSO}_4) = 57.61\%$ ($\text{SD}(\text{rel}) = 0.03\%$, $n = 6$). An example titration curve is shown in **Figure 2**.

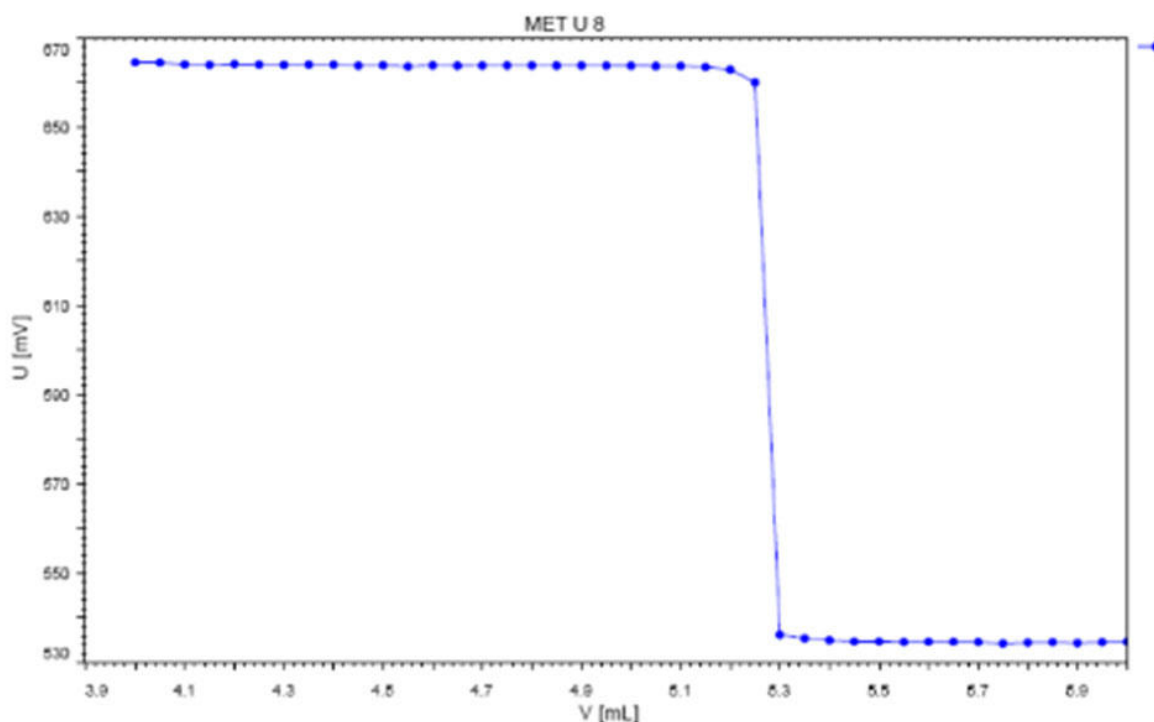


Figure 2. Example titration curve for photometric zinc sulfate determination. The break point is quite obvious in this chart.

CONCLUSION

The purity of zinc sulfate can easily be assessed using photometric titration. To reliably indicate the color change, a sensor such as the Optrode should be used. This has the advantage that the analysis is performed objectively, and the endpoint is always designated at the same color

change. The use of a Metrohm autotitrator and software in place of manual titration allows completely automated documentation for full traceability according to various regulations.

The analysis fully complies with Ph.Eur. and USP.

Internal reference: AW TI CH1-1311-012012

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CONFIGURATION



907 Titrando

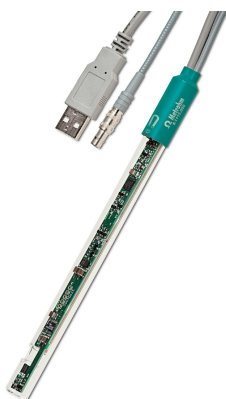
用于使用一个测量接口和 Dosino 加液单元电位分析和容量卡尔·费休滴定法滴定的电位滴定仪。

- 多达四套 800 Dosino 加液系统
- 动态(DET)、等量(MET)和终点滴定(SET),酶和 pH-STAT 滴定(STAT)、卡尔·费休容量滴定 (KFT)
- 使用离子选择性电极测量(MEAS CONC)
- 智能电极“iTrode”
- 带监控的加液功能,LQH
- 用于其他搅拌器或加液器系统的四个 MSB 接口
- USB 接口
- 使用 OMNIS-Software、*tiamo*-软件或 Touch Control
- 如果需要,满足 GMP/GLP 和 FDA 要求,比如 21 CFR 第 11 部分



804

滴定台及802杆式螺旋桨搅拌器的控制器,如果与802型杆式螺旋桨搅拌器联用,则可为您在磁力搅拌器之外提供另一选择。Ti Stand工作台带有底板、支撑杆与电极固定器。



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

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