



Application Note AN-T-240

用滴定法算酸数

Determination of total acid number of petroleum products

The total acid number (TAN) measures the acidic components in a substance, typically in petroleum products like engine oils or lubricants. The TAN value indicates the quantity of acid in milligrams of potassium hydroxide (KOH) which is required to neutralize one gram of the sample. The TAN value is an important parameter for assessing the acidity of oils and fuels. Regular monitoring of total acidity is essential for many reasons. It helps ensure proper performance and longevity of lubricants or petroleum products.

Fresh, unused oils have a low TAN value, but a high TBN (total base number) value. Over the service life of the oil, the TAN value increases while the TBN value (a measure of the alkaline reserve to neutralize acids) decreases.

The total acid number is an important parameter to monitor in petroleum products because excessive acidity can lead to corrosion and impairment of equipment. This Application Note describes the determination of TAN in sliding track oil with conductometric titration.

SAMPLE

Sliding track oil

EXPERIMENTAL

The sample was titrated with potassium hydroxide in 2-propanol solution until after the

first equivalence point. The 5-ring conductivity measuring cell was used for this analysis.

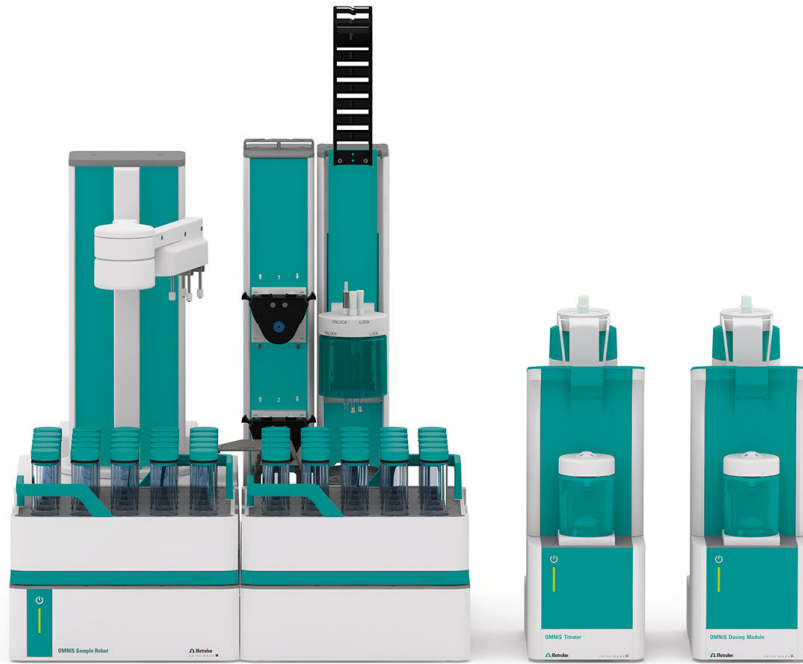


Figure 1. OMNIS Titrator with an OMNIS Dosing Module and OMNIS sample robot.

RESULTS

The determination of the TAN value (Table 1) gave accurate results. An example

determination is shown in Figure 2.

Table 1. Results of the sliding track oil determination by conductometric titration.

Sample	Result TAN	RSD in %
Sample (n=3)	0.40 mg KOH/g	1.1



Figure 2. Example curve to determine the total acid number in sliding track oil.

CONCLUSION

This method does not require indicators or complicated instruments. Compared to other titration methods, it is extremely sensitive and delivers precise results. The measurement is easy to carry out. It can be used for a wide range of sample types, including solutions, suspensions, and slurries.

The robust design of the conductivity sensor

allows for easy cleaning. In contrast to potentiometric sensors, it does not require any rehydration period between the measurements. Conductivity titration can be used for highly diluted solutions, nonaqueous solutions, and titration of weak acids or bases. The endpoint of this titration method is sharp and precise compared to other titration methods.

CONTACT

Metrohm AG
Ionenstrasse
9100 Herisau

info@metrohm.com

CONFIGURATION



OMNIS Titrator

新型、模式位分析 OMNIS Titrator 滴定,于独立行或作 OMNIS 滴定系的核心元件行。由于采用 3S 瓶配器技,理化学品很安全。可以使用量模和量管元自由配置滴定,并在需要展一台拌器。由于采用不同的件功能可,因此可以有不同的量模式和功能。

- 通算机或本地网控制
- 可以其他用或助溶液外接四个滴定模或加液模
- 螺旋拌器的接方式
- 可提供不同大小的量管:5、10、20 或 50 mL
- 采用 3S 技的瓶配器:安全理化学品,自生商的原
始数据

量模式和件:

- 点定滴定:“Basic” 功能可
- 点和等当点滴定(-/):“Advanced” 功能可
- 点和等当点滴定(-/),包括平行滴定
:“Professional” 功能可

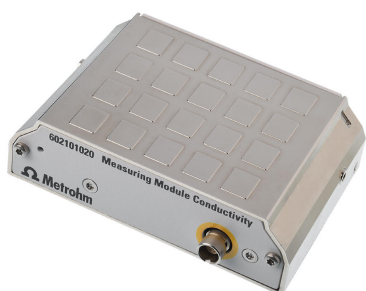
OMNIS

A WHOLE NEW LEVEL OF PERFORMANCE

功能可“率滴定”,用于 OMNIS Titrator
包含功能模式

- MET COND
- MEAS U / T / pH / COND
- 快量化液体理
- 使用一个 OMNIS Tritator 的内部滴定管行滴定

OMNIS Titrator 或滴定模的量通道,用于接。





5 $c = 0.7 \text{ cm}^{-1}$ Pt10000.65 m

池常数的 5 $c = 0.7 \text{ cm}^{-1}$ (指数),集成有温度探
Pt1000 和固定 (0.65 m),用于接到 OMNIS 率量模上

。

感器用于量中等的率($5 \mu\text{S}/\text{cm}$ 至 $20 \text{ mS}/\text{cm}$),例如:

- 用水
- 地表水
- 水