Fully automated TAN/TBN analysis according to ASTM D 664 and D 2896

- **Cost-efficient:** Fully automated process reduces time and personnel requirements
- **Reliable:** Reproducible results thanks to robust automation
- **Convenient:** Easy control and professional data handling with *tiamo*™, the titration software

Ω Metrohm

Acid and base number determinations – easy with Metrohm

The base number quantifies the alkaline components in petroleum products, which are determined as a sum parameter. These include primary organic and inorganic amino compounds in particular. However, salts of weak acids, basic salts of polycarboxylic acids, some heavy metal salts, and detergents are also detected. The base number indicates how many basic components are contained in 1 g of sample, and is expressed as mg KOH. This determination is used to detect changes in the product during use.

The acid number quantifies the acidic components in petroleum products, which are measured as a sum parameter.

These components are compounds (acids and salts) with pKs values < 9, and the acid number indicates how many mg of KOH are required to neutralize 1 g of sample. The acid number indicates changes in the product during use. Both parameters are determined by potentiometric titration in nonaqueous solvents or solvent mixtures.

Metrohm offers a complete system that enables easy, rapid, and reproducible determinations of these two important parameters – fully automated, from the addition of the solvent to the cleaning of the electrode.

«Our automated Metrohm system enables us to determine TAN and TBN values rapidly, safely, and conveniently in around 100 lubricating oil samples per day.»
Lin Li, Manger at WesTrac Caterpillar in Tianjin, China

The challenges of electrode handling

For measurements in non-aqueous media – as is the case with TAN and TBN determinations – the electrode membrane requires careful, multi-step handling between sample measurements. Only the automation of this procedure can guarantee that every cleaning or conditioning step is carried out in exactly the same manner. This requirement for electrode handling is related to the need to reduce the exposure of users to aggressive solvents as much as possible.

Reproducible measurements, maximum user safety

The complete system developed by Metrohm ensures both: The fully automated reagent and electrode handling ensures reproducible measurements while at the same time accommodating the need for user safety. The user need only place the sample on the sample processor turntable and start the system. Likewise, any blank determinations of the solvent used and titer determinations of the titrant are carried out completely automatically. Users can then concentrate on the essentials – evaluation of the results.

Thanks to the concise database in ***tiamo***™, users always have the big picture in view. Control charts, filter and export functions, together with the freely definable layout of the database interface, enable convenient and flexible data management.
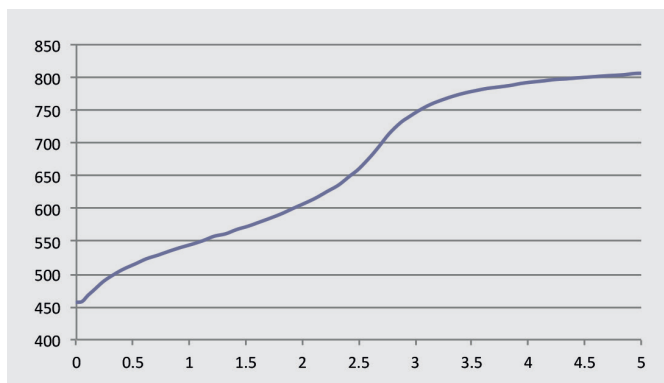
Titration curve of the TBN analysis of a used motor oil

Used motor oil	TBN [mg KOH/g]
1	6.145
2	6.315
3	6.170
4	6.102
5	6.178
6	6.309
Average	**6.203**
s(abs)	**0.088**
s(rel)	**1.42 %**

Results of the TBN analysis of a used motor oil

Ordering information

MATi 02: Automated TAN/TBN analysis

www.metrohm.com

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