



Application Note AN-T-206

石油基碳氢化合物的溴指数

Environmentally beneficial determination based on ASTM D2710 and IP 299

The bromine index is an important parameter for the determination of aliphatic C=C double bonds in petroleum hydrocarbons. Bromine is generated in-situ from a solution of bromide and bromate, and the bromine index is determined by an electrochemical titration at 5 ° C. For the titration, a solvent mixture of glacial

acetic acid, methanol, and dichloromethane is usually used.

In this Application Note, the chlorinated solvent in the solvent mixture was replaced with toluene, resulting in a more environmentally beneficial method in comparison to ASTM D2710 and IP 299.

SAMPLE AND SAMPLE PREPARATION

This application is demonstrated on heptane

and cyclohexene, respectively.

EXPERIMENTAL

The analysis is carried out on an OMNIS Advanced Titrator equipped with a double Pt wire electrode.

Before the sample is determination is determined, a blank determination is performed.

An appropriate amount of sample and solvent mixture consisting of glacial acetic acid, methanol, and toluene are added into the titration vessel. While stirring, the solution is cooled below 5 ° C. The solution is then titrated with a solution of potassium bromide and potassium bromate until after the equivalent point is reached.



Figure 1. OMNIS Advanced Titrator equipped with a double Pt wire electrode for the determination of the bromine index.

RESULTS

Well-defined, steep titration curves are obtained for both samples. In addition, low relative

standard deviations below 1% are achieved. The results are displayed in **Table 1**.

Table 1. Results of the bromine index determination in heptane and cyclohexene.

Bromine index (n = 6)	Heptane in mg/100 g sample	Cyclohexene in mg/100 g sample
Mean	0.66	90.61
SD(abs) / (mg/ 100 g sample)	0.003	0.63
SD(rel) / (%)	0.4	0.7

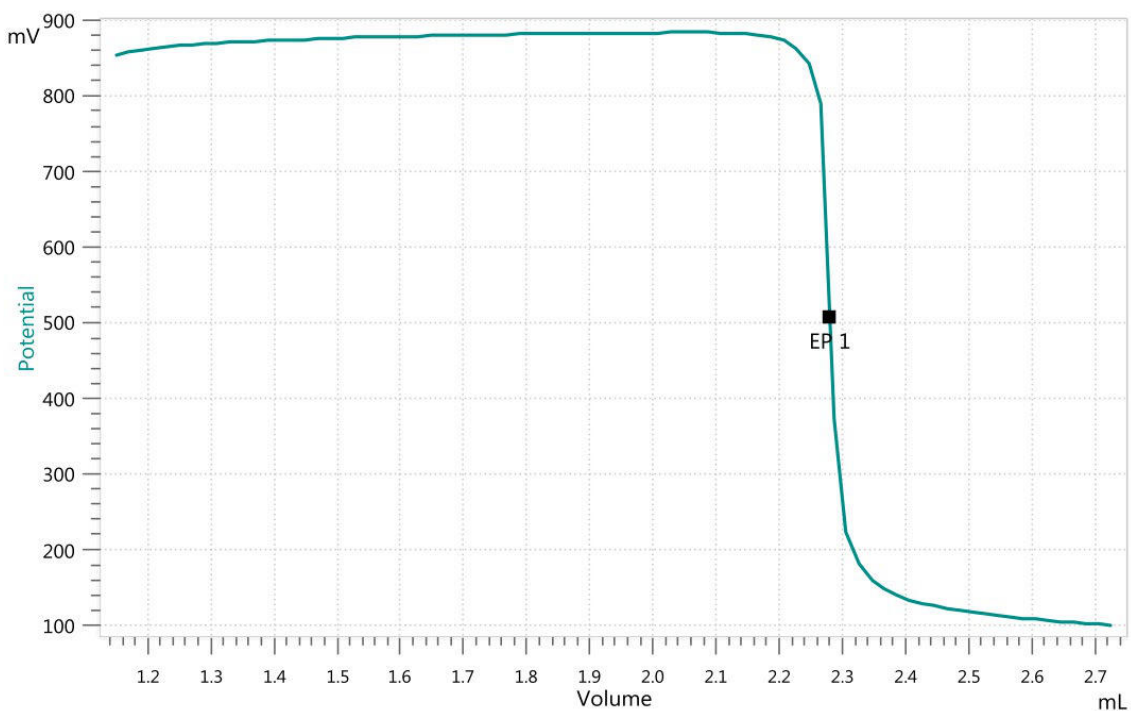


Figure 2. Example titration curve of the bromine index determination in cyclohexene.

CONCLUSION

Titration is an inexpensive method, allowing precise and reliable determinations of the bromine index of petroleum hydrocarbons based on **ASTM D2710** and **IP 299**. The replacement of dichloromethane with toluene

provides an environmentally friendly alternative for the analysis.

Using an OMNIS Titrator allows you to customize the system according to your needs and expand it for other titration applications.

Internal reference: AW TI CH1-1263-122018

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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



OMNIS Dosing Module

用于与 OMNIS Titrator 滴定仪相连的加液模块,以扩展额外用于滴定/加液的滴定管。可以扩展磁力搅拌器和/或螺旋搅拌器,以作为单独的滴定台使用。可自由选择 5、10、20 或 50 mL 计量管单元。



指示电极,用于库仑法卡尔费休滴定。



Pt1000 12.5 cm

玻璃材质 Pt1000 温度传感器(B 级)。

物品编号为 6.1110.110 的 Pt1000 温度传感器也有 17.8 cm 安装长度的版本可供选购。