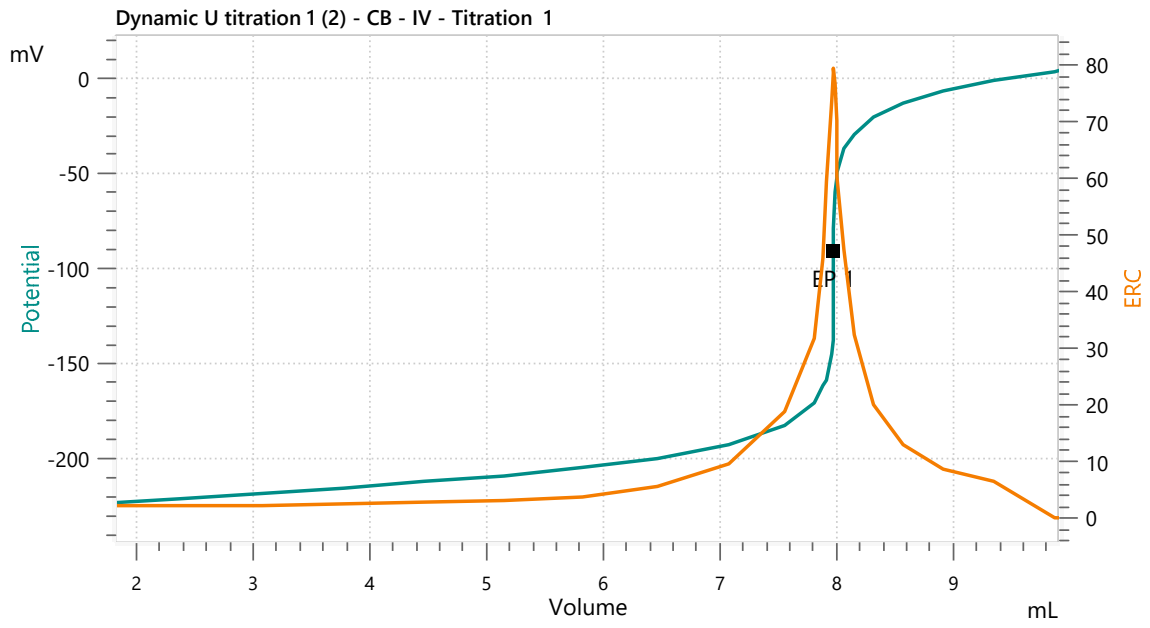
Titration Application Note T-176

Iodine adsorption number of carbon black

Fully automated and parallelized determination according to ASTM D1510



The quantification of the surface area of carbon black, an important raw material for several products like batteries, paintings, and rubber, is given by the iodine adsorption number (IAN). This application note presents a fully automated IAN determination on an OMNIS system according to ASTM D1510 Method B.

With OMNIS, Metrohm offers a solution for fully automated analyses without the need to perform either sample preparation or manual determinations, increasing both the safety and cleanliness in the laboratory. Parallelization increases the sample throughput up to 70% compared to competing automated procedures.

Metrohm

Method description

Sample

Carbon black

Sample preparation

The carbon black is dried at 125 °C and allowed to cool down in a desiccator.

Configuration

dPt Titrode	6.00401.300

Analysis

On each Pick&Place, the sample is prepared by adding 50 mL of iodine solution (prepared according to ASTM D1510) to an appropriate amount of dried carbon black. The recommended sample size depends on the estimated iodine adsorption number (IAN). The estimations are based on the synthesis procedures, used raw materials, and fabricants. The iodine adsorbs on the carbon black while stirring with a magnetic stirrer for 3 minutes. Afterwards, the suspension is left to settle without stirring for an additional 2 minutes.

The clarified solution is aspirated through a syringe filter into the cylinder unit. A 10 mL aliquot of the filtered solution is automatically dosed into the workstation, where the aliquot is diluted with approximately 40 mL of deionized water. Afterwards, this mixture is titrated with sodium thiosulfate solution until after the equivalence point.

Results

Sample	IAN	s(rel) % (n = 5)
Carbon black	108.2	0.58

Summary

A fully automated analysis of the IAN of carbon black is performed on an OMNIS system. The analysis of the IAN can be run in parallel on up to four Pick&Place modules, increasing the sample throughput by up to 70%. All sample preparation steps as well as filtration are carried out fully automatically. Therefore, with OMNIS, the IAN of carbon black can be determined faster, safer, and cleaner than ever before.

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