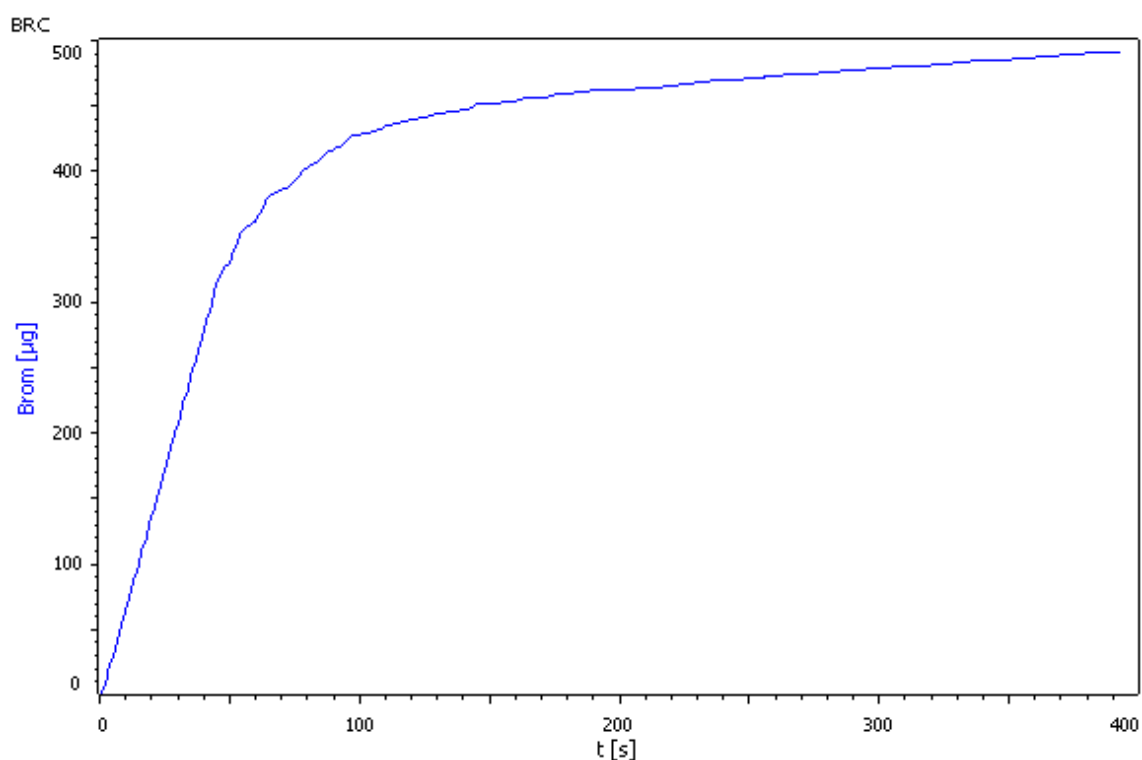


Determination of the bromine index of aromatic hydrocarbons by coulometric titration according to ASTM D1492



The bromine index indicates the degree of unsaturation and relies on the simple addition of bromine to the double bond of alkenes. One mole of bromine is consumed for each mol of carbon-carbon double bond. The bromine index indicates the olefin content in aromatic hydrocarbons. This Application Note describes the determination by coulometric titration according to ASTM D1492.

Method description

Sample

Petroleum hydrocarbon

Sample preparation

No sample preparation is required.

Configuration

851 Titrand with generator electrode without diaphragm	2.851.0110
801 Stirrer with stand	2.801.0040
KF titration vessel / 80-250 mL / coulometric	6.1464.320
KF adsorber tube for coulometer cell	6.1403.030
SGJ stopper SGJ 14	6.1437.000
Titration vessel holder	6.2047.020
Stirring bar / 25 mm	6.1903.030
Needle with Luer connector	6.2816.030
Syringe, glass with Teflon seal	-
GL 18 screw cap with hole	6.2701.040
Septum 16 mm	6.1448.020
Double Pt-wire electrode for coulometry	6.0341.100
<i>tiamo</i> TM 2.5	6.6056.252

Solutions

Cell electrolyte	$\Phi(c(\text{KBr}) = 1.0 \text{ mol/L} = 14\% \text{ (v/v)},$ $\Phi(\text{methanol}) = 26\% \text{ (v/v)},$ $\Phi(\text{glacial acetic acid}) = 60\% \text{ (v/v)}$ 260 mL $w(\text{methanol}) \geq 99.8\%$ and 140 mL $c(\text{KBr}) = 1.0 \text{ mol/L}$ are added into a 1000 mL volumetric flask. The flask is then filled up to the mark with $w(\text{glacial acetic acid}) \geq 99.8\%$.
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Analysis

125 mL cell electrolyte is added in the KF titration vessel. 0.06 g to 1.00 g of the sample, corresponding to the expected bromine index, is added with a syringe.

While stirring, the sample is titrated until the end point was reach.

Expected bromine index / mg bromine/100 g sample	Sample size / g
0 to 20	1.000
20 to 200	0.600
200 to 2000	0.060

Parameters

Mode	BRC
I(pol)	1.0 μA
Generator current	400 mA
Pause	0 s
Signal drift	Off
EP at	200.0 mV
Stirring rate	8
Dynamics	400.0 mV
Max. rate	500.0 $\mu\text{g/min}$
Min. rate	25.0 $\mu\text{g/min}$
Stop criterion	time
Delay time	40 s
Extraction time	0 s
Temperature	25.0 $^{\circ}\text{C}$
Time interval measuring point	2.0 s
Stop time	Off
Conditioning	
Start drift	20.0 $\mu\text{g/min}$
Drift correction	Off
Stop time	Off
Stabilizing time	0 s
Sample addition time	12 s

Results

Sample	Result / (n = 3)	s(rel)
Petroleum hydrocarbon	38.37 mg bromine/100g sample	0.2%

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