Determination of Peroxide value
**Application**

**Use**

The peroxide number gives the initial evidence of rancidity in unsaturated fats and oils. Other methods are available but peroxide value is the most widely used. It gives a measure of the extent to which an oil sample has undergone primary oxidation.

**Appliances**

- Titrator: TL 6000/7000 (TL 6000/7000 M1/10) consists of
  - Basic device
  - Magnetic stirrer TM 235
  - 10 mL exchange unit WA 10, with brown glass bottle for titrant complete

**Electrodes**

- Electrode: Pt 62 or Pt 61, or Pt 62 RG with cable L 1 A

**Reagents**

- Titration agent: Sodium thiosulphate solution \( \text{Na}_2\text{S}_2\text{O}_3 \) 0.01 or 0.001 mol/L
- Solvent: Acetic acid/chloroform or acetic acid/decanol (3/2)
- Other reagents: Potassium iodine solution sat.

**Description**

**Preparation of Sodium thiosulfate solution 0.01 or 0.001 mol/L**

The 0.01 or 0.001 mol/L titrant are prepared freshly from a 0.1 mol/L titrant solution. The solution should be stored in a dark place.

**Preparation of the solvent mixture**

For 1 L solvent mixture add 600 mL acetic acid to 400 mL chloroform or decanol (hexanole is also suitable)

**Preparation of the potassium iodine solution**

The solution should be freshly prepared before using. Mix 1.0 g potassium iodine and 1.3 g distilled water.

**Titration**

Weigh 1 g or more of the sample (exactly on 0,0001 g) in an Erlenmeyer volumetric flask. Add 30 mL of the solvent mixture to dissolve the sample. Add 0.5 mL of the potassium iodine solution, close the Erlenmeyer flask with a stopper and stir well for 60 sec. Add 30 mL of distilled water, place the electrode and titration tip in the sample and start the method (stir very well). Carry out a blank titration without the sample in the same matter before. The result of PV is calculated in milliequivalents O₂ per kg sample.

**Electrode handling**

If not in use, the electrolyte should be stored in the electrolyte solution. For further details, please refer to the electrode’s operating instructions.
Methods

Blank value (page 1):

GLP documentation

Titration graph

mV/ml

Solvent

ml

Method data
Method name: POV Blank
End date: 03.05.13
Titration duration: 4 m 20 s
End time: 16:52:27

Titration data
Sample ID: Solvent
Start mV: 223.0 mV
Weight: 1.00000 g
End mV: 164.9 mV

EQ: 0.012 ml / 202.6 mV
Blank: 0.012 ml

Calculation formula
Blank: EQ1 -> M01

Statistics: Off

Statistics: Off
Method data overall view

Method name: POV Blank
Method type: Automatic titration
Measured value: mV
Titration mode: Linear
Linear stops: 0.004 ml

Created at: 04/30/13 16:06:44
Last modification: 05/03/13 15:43:45
Damping settings: None
Documentation: GLP

Measuring speed / drift: User-defined:
minimum holding time: 04 s
maximum holding time: 15 s
Measuring time: 03 s
Drift: 10 mV/min

Initial waiting time: 5 s
Titration direction: Decrease
Pre titration: Off
End value: Off
EQ: Off

Dosing parameter

Dosing speed: 100.00 %
Filling speed: 30 s
Maximum dosing volume: 0.20 ml

Unit values

Unit size: 10ml
Unit ID: 10035516
Reagent: Na2S2O3
Batch ID: no entry
Concentration [mol/l]: 0.01000
Determined at: 04/09/13 19:04:39
Expire date: --
Opened/compounded: --
Test according ISO 8655: --
Last modification: 04/09/13 12:04:42
**GLP documentation**

**Titration graph**

- **Olive oil**

**Method data**
- **Method name:** POV
- **End date:** 03.05.13
- **Titration duration:** 1 m 59 s
- **End time:** 16:55:47

**Titration data**
- **Sample ID:** Olive oil
- **Start mV:** 289.3 mV
- **Weight:** 1.00940 g
- **End mV:** 173.2 mV
- **EQ:** 1.624 ml / 208.7 mV
- **POV:** 15.97

**Calculation formula**
- **POV:** \((\text{EQ1-B}) \times \text{T} \times \text{M} \times \text{F1/(W \times F2)}\)
- **Mol (M):** 1000.00000
- **Blank value (B):** 0.0120 ml (M01)
- **Factor 1 (F1):** 1.0000
- **Factor 2 (F2):** 1.0000
- **Titre (T):** 0.01000000 (a)
- **Weight (W):** 1.00940 g (m)
- **Statistics:** Off
Sample titration (page 2):

**Method data overall view**

<table>
<thead>
<tr>
<th>Method name:</th>
<th>P0V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method type:</td>
<td>Automatic titration</td>
</tr>
<tr>
<td>Measured value:</td>
<td>mV</td>
</tr>
<tr>
<td>Titration mode:</td>
<td>Dynamic</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dynamic:</th>
<th>Average</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Measuring speed / drift:</th>
<th>User-defined:</th>
</tr>
</thead>
<tbody>
<tr>
<td>minimum holding time:</td>
<td>03 s</td>
</tr>
<tr>
<td>maximum holding time:</td>
<td>15 s</td>
</tr>
<tr>
<td>Measuring time:</td>
<td>03 s</td>
</tr>
<tr>
<td>Drift:</td>
<td>10 mV/min</td>
</tr>
</tbody>
</table>

| Initial waiting time:   | 0 s                          |
| Titrination direction:  | Decrease                     |
| Pretitrination:         | Off                          |
| End value:              | Off                          |
| EQ:                     | On (1)                       |
| Slope value:            | Flat                         |

| Slope value:            | Flat                         |
| Value:                  | 120                          |

**Dosing parameter**

| Dosing speed:           | 100.00 %                     |
| Maximum dosing volume:  | 5.00 ml                      |

| Filling speed:          | 30 s                         |

**Unit values**

| Unit size:              | 10ml                         |
| Unit ID:                | 10035516                     |
| Reagent:                | Na2S2O3                      |
| Batch ID:               | no entry                     |
| Concentration [mol/l]:  | 0.01000                      |
| Determined at:          | 04/09/13 19:04:39            |
| Expire date:            | --                           |
| Opened/compounded:      | --                           |
| Test according ISO 8655:| --                           |
| Last modification:      | 04/09/13 12:04:42            |

Hints

If you have any questions concerning the application, you are welcome to contact us.

Literature

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