
**Animal and vegetable fats and oils —
Determination of phosphorus content —**

**Part 1:
Colorimetric method**

*Corps gras d'origines animale et végétale — Détermination de la teneur
en phosphore —*

Partie 1: Méthode colorimétrique



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Foreword

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ISO 10540-1 was prepared by Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 11, *Animal and vegetable fats and oils*.

ISO 10540 consists of the following parts, under the general title *Animal and vegetable fats and oils — Determination of phosphorus content*:

- *Part 1: Colorimetric method*
- *Part 2: Method using graphite furnace atomic absorption spectrometry*
- *Part 3: Method using inductively coupled plasma (ICP) optical emission spectroscopy*

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Animal and vegetable fats and oils — Determination of phosphorus content —

Part 1: Colorimetric method

1 Scope

This part of ISO 10540 specifies a colorimetric method for the determination of the phosphorus content of animal and vegetable oils and fats.

This method is not suitable for determining the phosphorus content of commercial lecithin as this requires an ashing temperature of 800 °C.

2 Principle

The test portion is charred (carbonized) in the presence of magnesium hydroxycarbonate and then ashed. The ash is dissolved in dilute hydrochloric acid. The phosphorus content is then determined colorimetrically by the molybdenum blue method.

3 Reagents

Use only reagents of recognized analytical grade, unless otherwise stated.

3.1 Magnesium hydroxycarbonate, $[(\text{MgCO}_3)_n \cdot \text{Mg}(\text{OH})_2] \cdot \text{H}_2\text{O}$, with a magnesium oxide content of between 40 % and 46 % (by mass).

Magnesium carbonate, hydrated, basic, $[(\text{MgCO}_3)_4 \cdot \text{Mg}(\text{OH})_2] \cdot 5\text{H}_2\text{O}$, is suitable.

3.2 Hydrochloric acid, $c(\text{HCl}) = 2 \text{ mol/l}$.

3.3 Sodium hydroxide solution, $c(\text{NaOH}) = 5 \text{ mol/l}$.

3.4 Reducing solution.

Weigh out 0,500 g of *p*-methylaminophenol sulfate $[(\text{HOC}_6\text{H}_4\text{NHCH}_3)_2 \cdot \text{H}_2\text{SO}_4]$, 2,5 g of sodium sulfite heptahydrate ($\text{Na}_2\text{SO}_3 \cdot 7\text{H}_2\text{O}$) and 58,5 g of sodium metabisulfite ($\text{Na}_2\text{S}_2\text{O}_5$).

Transfer the weighed materials to a 1 litre volumetric flask. Dissolve in water, then dilute to the mark and mix. Keep the solution in a well-sealed brown bottle.

3.5 Sulfate/molybdate reagent.

Dissolve 25,0 g of ammonium molybdate tetrahydrate $[(\text{NH}_4)_6\text{Mo}_7\text{O}_{24} \cdot 4\text{H}_2\text{O}]$ in 250 ml of 5 mol/l sulfuric acid [prepared by diluting 278 ml of concentrated (18 mol/l) sulfuric acid to 1 litre with water]. Transfer the solution to a 1 litre volumetric flask. Dilute to the mark with water, and mix. Store the solution in a brown bottle.