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# Hydrogenated Coconut Oil

Hydrogenated coconut oil

CAS RN®: 84836-98-6.

## DEFINITION

Hydrogenated Coconut Oil is the product obtained by refining and hydrogenating the oil obtained from the seeds of *Cocos nucifera* L. (Fam. Palmae).

## IDENTIFICATION

- **A.** It meets the requirements in *Specific Tests* for *Fats and Fixed Oils, Fatty Acid Composition*⟨401⟩.
- **B.** It meets the requirements in *Specific Tests* for *Melting Range or Temperature*⟨741⟩.

## IMPURITIES

- **Residue on Ignition ⟨281⟩**

  **Sample:** 5 g

  **Acceptance criteria:** NMT 0.1%

- **Limit of Nickel**

  **Nickel standard solution:** Immediately before use, prepare the equivalent of 0.2 µg/mL of nickel by diluting 10 mL of nickel standard solution TS with water to 500 mL.

  **Sample solution:** Weigh 5.0 g of Hydrogenated Coconut Oil into a previously tared platinum or silica crucible. Cautiously heat the substance, and introduce into it a wick formed from twisted, ashless filter paper. Ignite the wick. When the substance ignites, stop heating. After combustion, ignite in a muffle furnace at about 600°. Continue the incineration until a white ash is obtained. After cooling, with the aid of two 2-mL portions of diluted hydrochloric acid, transfer the residue to a 25-mL volumetric flask, add 0.3 mL of nitric acid, and dilute with water to volume.

  **Standard solutions:** Into four separate identical 10-mL volumetric flasks, introduce respectively 0, 1.0, 2.0, and 4.0 mL of *Nickel standard solution*. To each flask add a 2.0-mL portion of the *Sample solution*, and dilute with water to volume to obtain four *Standard solutions* containing an added quantity of nickel of 0, 0.2, 0.4, and 0.8 µg, respectively.

  **Instrumental conditions**

  (See *Atomic Absorption Spectroscopy ⟨852⟩*.)

  **Mode:** Atomic absorption spectrophotometer, equipped with a graphite furnace

  **Analytical wavelength:** 232.0 nm

  **Lamp:** Nickel hollow–cathode

  **Analysis**

  **Samples:** *Standard solutions*

  Concomitantly determine the absorbances of the *Standard solutions* at least three times each. Record the average of the steady readings for each of the *Standard solutions*. Plot the absorbances of the *Standard solutions* versus the added quantity, in µg, of nickel. Extrapolate the line joining the points on the graph until it meets the quantity axis. The distance between this point and the intersection of the axes represents the quantity of nickel, in µg, in the 2-mL portion of the *Sample solution*.

  Calculate the content of nickel in the portion of the sample taken:

$$\text{Result} = [V \times (A/V_A)]/W$$

  $V$ = volume of the *Sample solution*, 25 mL

  $A$ = nickel, as determined above

  $V_A$ = volume of the *Sample solution* added to the *Standard solutions*, 2 mL

*W* = weight of Hydrogenated Coconut Oil taken to prepare the *Sample solution* (g)

**Acceptance criteria:** NMT 1 µg/g

- **Alkaline Impurities**

**Sample:** 2.0 g

**Analysis:** Dissolve the *Sample* by gently heating in a mixture of 1.5 mL of alcohol and 3.0 mL of toluene. Add 0.05 mL of bromophenol blue TS, and titrate with 0.01 N hydrochloric acid VS to a yellow endpoint.

**Acceptance criteria:** NMT 0.4 mL of 0.01 N hydrochloric acid VS is required.

## SPECIFIC TESTS

- **Melting Range or Tempurature ⟨741⟩:** 30°–38°
- **Fats and Fixed Oils,** *Acid Value, Method II*⟨401⟩**:** NMT 2.0
- **Fats and Fixed Oils,** *Fatty Acid Composition*⟨401⟩**:** Hydrogenated Coconut Oil exhibits the following composition profile of fatty acids in *Table 1*.

**Table 1**

| Carbon-Chain Length | Number of Double Bonds | Percentage (%) |
|---|---|---|
| 6 | 0 | ≤1.5 |
| 8 | 0 | 5.0–9.0 |
| 10 | 0 | 4.0–9.0 |
| 12 | 0 | 44.0–52.0 |
| 14 | 0 | 15.0–20.0 |
| 16 | 0 | 8.0–11.0 |
| 18 | 0 | 8.0–14.0 |
| 20 | 0 | ≤0.2 |
| >20 | 0 | ≤0.5 |
| 16 | 1 | ≤1.0 |
| 18 | 1 | ≤1.5 |
| 18 | 2 | ≤0.5 |
| 18 | 3 | ≤0.2 |
| 20 | 1 | ≤0.2 |

- **Fats and Fixed Oils,** *Peroxide Value*⟨401⟩**:** NMT 5.0
- **Fats and Fixed Oils,** *Unsaponifiable Matter*⟨401⟩**:** NMT 0.8%
- **Loss on Drying ⟨731⟩**

**Analysis:** Dry a sample at 105° for 4 h.

**Acceptance criteria:** NMT 0.1%

## ADDITIONAL REQUIREMENTS

- **Packaging and Storage:** Preserve in tight, light-resistant containers, and store at a temperature not exceeding 55°.

**Auxiliary Information** - Please check for your question in the FAQs before contacting USP.

| Topic/Question | Contact | Expert Committee |
|---|---|---|
| HYDROGENATED COCONUT OIL | Documentary Standards Support | CE2020 Complex Excipients |

**Chromatographic Database Information:** Chromatographic Database

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