BEESWAX

Revised specifications prepared at the 65th JECFA (2005) and published in FNP 52 Add 13 (2005), superseding specifications prepared at the 39th JECFA (1992) and published in FNP 52 Add 1 (1992), and incorporating the decisions on the metals and arsenic specifications agreed at the 63rd JECFA (2004) and published in FNP 52 Add 12 (2004). The 65th JECFA (2005) considered the additive to be of no toxicological concern for the functional uses listed.

SYNONYMS INS No. 901

DEFINITION Beeswax is obtained from the honeycombs of bees (Fam. *Apidae*, e.g. *Apis mellifera L*) after the honey has been removed by draining or centrifuging. The combs are melted with hot water, steam or solar heat; the melted product is filtered and cast into cakes of yellow beeswax. White beeswax is obtained by bleaching the yellow beeswax with oxidizing agents, e.g. hydrogen peroxide, sulfuric acid, or sunlight.
Beeswax consists of a mixture of esters of fatty acids and fatty alcohols, hydrocarbons and free fatty acids; minor amounts of free fatty alcohols are also present.

C.A.S. number 8006-40-4 (yellow beeswax)
8012-89-3 (white beeswax)

DESCRIPTION Yellow beeswax: yellow or light-brown solid that is somewhat brittle when cold and presents a dull, granular, non-crystalline fracture when broken; it becomes pliable at about 35°. It has a characteristic odour of honey.

White beeswax: white or yellowish white solid (thin layers are translucent) having a faint and characteristic odour of honey

FUNCTIONAL USES Glazing agent; release agent; stabilizer; texturizer for chewing gum base; carrier for food additives (including flavours and colours); clouding agent

CHARACTERISTICS

IDENTIFICATION

Solubility (Vol. 4) Insoluble in water; sparingly soluble in alcohol; very soluble in ether

PURITY

Melting range (Vol. 4) 62 - 65°

Acid value (Vol. 4) 17 - 24

Peroxide value Not more than 5
See description under TESTS

Saponification value (Vol. 4) 87 -104

Carnauba wax Passes test
See description under TESTS

Ceresin, paraffins, and Passes test

certain other waxes	See description under TESTS
Fats, Japan wax, rosin and soap	Passes test See description under TESTS
Glycerol and other polyols	Not more than 0.5 % (calculated as glycerol) See description under TESTS
Lead (Vol. 4)	Not more than 2 mg/kg Determine using an atomic absorption technique appropriate to the specified level. The selection of sample size and method of sample preparation may be based on the principles of the methods described in Volume 4, "Instrumental Methods".

TESTS

PURITY TESTS

Peroxide value

Weigh accurately 5 g of the sample into a 200-ml conical flask. Add 30 ml of a 2:3 solution of chloroform and acetic acid TS and close the flask with a stopper. Heat with warm water and swirl to dissolve the sample. Cool to room temperature and add 0.5 ml of saturated potassium iodide solution. Close the flask with the stopper and shake vigorously for 60±5 sec. Add 30 ml of water and titrate immediately with 0.01 N sodium thiosulfate using starch TS as indicator. Carry out a blank determination.

Peroxide value = $(a-b) \times N \times 1000/W$
where
a = volume (ml) of sodium thiosulfate used for the sample
b = volume (ml) of sodium thiosulfate used for the blank
N = normality of the sodium thiosulfate
W = weight of sample (g)

Carnauba wax

Transfer 100 mg of the sample into a test tube, and add 20 ml of *n*-butanol. Immerse the test tube in boiling water, and shake the mixture gently until the sample dissolves completely. Transfer the test tube to a beaker of water at 60 °, and allow the water to cool to room temperature. A loose mass of fine, needle-like crystals separates from a clear mother liquor. Under the microscope, the crystals appear as loose needles or stellate clusters, and no amorphous masses are observed, indicating the absence of carnaúba wax.

Ceresins, paraffins and certain other waxes

Transfer 3.0 g of the sample to a 100 ml round-bottomed flask, add 30 ml of a 4% w/v solution of potassium hydroxide in aldehyde-free ethanol and boil gently under a reflux condenser for 2 h. Remove the condenser and immediately insert a thermometer. Place the flask in water at 80° and allow to cool, swirling the solution continuously. No precipitate is formed before the temperature reaches 65°, although the solution may be opalescent.

Fats, Japan wax, rosin and soap

Boil 1 g of the sample for 30 min with 35 ml of a 1 in 7 solution of sodium hydroxide, maintaining the volume by the occasional addition of water, and cool the mixture. The wax separates and the liquid remains clear. Filter the cold mixture and acidify the filtrate with hydrochloric acid. No precipitate is formed.

Glycerol and other polyols

To 0.20 g of the sample in a round-bottom flask, add 10 ml of ethanolic potassium hydroxide TS, attach a reflux condenser to the flask and heat in

a water bath for 30 min. Add 50 ml of dilute sulfuric acid TS, cool and filter. Rinse the flask and filter with dilute sulfuric acid TS. Combine the filtrate and washings and dilute to 100.0 ml with dilute sulfuric acid TS. Place 1.0 ml of the solution in a tube, add 0.5 ml of a 1.07 % (w/v) solution of sodium periodate, mix and allow to stand for 5 min. Add 1.0 ml of decolourized fuchsin solution (see below) and mix. Any precipitate disappears. Place the tube in a beaker containing water at 40^{o}. Allow to cool while observing for 10 to 15 min. Any bluish-violet colour in the solution is not more intense than a standard prepared at the same time in the same manner using 1.0 ml of a 0.001 % (w/v) solution of glycerol in dilute sulfuric acid TS.

Decolourized Fuchsin Solution

Dissolve 0.1 g of basic fuchsin in 60 ml of water. Add a solution of 1 g of anhydrous sodium sulfite (Reagent grade) in 10 ml of water. Slowly and with continuous shaking of the solution add 2 ml of hydrochloric acid. Dilute to 100 ml with water. Allow to stand protected from light for at least 12 h, decolourize with activated charcoal and filter. If the solution becomes cloudy, filter before use. If on standing the solution becomes violet, decolourize again by adding activated charcoal. Store protected from light.