TALC

Prepared at the 61st JECFA (2003) and published in FNP 52 Add 11 (2003), superseding specifications prepared at the 55th JECFA (2000) and published in FNP 52 Add 8 (2000). An ADI "not specified" was established at the 30th JECFA (1986).

SYNONYMS Talcum; INS No. 553(iii)

DEFINITION Powdered, natural, hydrated magnesium silicate containing varying proportions of such associated materials as alpha-quartz, calcite, chlorite, dolomite, magnesite and phlogopite.

C.A.S. number 14807-96-6

DESCRIPTION Odourless, very fine, white or greyish white crystalline powder; unctuous, adheres readily to the skin, free from grittiness.

FUNCTIONAL USES Anticaking agent, filtering aid, coating agent, surface-finishing agent, texturizing agent, component of chewing gum base.

CHARACTERISTICS

IDENTIFICATION

Solubility (Vol. 4) Insoluble in water and ethanol

Infrared absorption The infrared absorption spectrum of a potassium bromide dispersion of the sample exhibits major peaks as follows:
3677 ± 2 cm^{-1} OH group
1018 ± 2 cm^{-1} Si-O-Si group
669 ± 2 cm^{-1} Mg-O-Si group

X-Ray diffraction The X-ray diffraction pattern of a random powder sample exhibits reflections at d values of 9.34 Å, 4.66 Å and 3.12 Å

PURITY

Loss on drying (Vol. 4) Not more than 0.5 % (105 ^{o}, 1 h)

Loss on ignition (Vol. 4) Not more than 9 %

Water-soluble substances Not more than 0.2 %
Boil 20 g sample with 200 ml of water in a 250 ml beaker for 15 min, stir to avoid spurting. Cool to room temperature, transfer the contents to a 250 ml volumetric flask, rinse beaker with 25 ml water, add rinsings to the volumetric flask and make up to volume. Allow the mixture to stand for 15 min and filter (use filtrate for the determination of water-soluble iron, below). Evaporate 100 ml of this solution, representing 8 g of talc, in a tared platinum dish on a steam bath to dryness and ignite gently to constant weight. The weight of the residue does not exceed 16 mg.

Water-soluble iron

Using hydrochloric acid TS, dilute, slightly acidify the remaining part of the filtrate obtained in the test for water-soluble substances (above) and add 1 ml of potassium ferrocyanide TS. The solution does not turn blue.

Acid-soluble substances

Not more than 2.5 %
Accurately weigh 2 g sample into a beaker and add 35 ml of 3N hydrochloric acid. Digest the sample at 50o for 15 min. Cool, transfer the contents into a 50 ml volumetric flask, rinse the beaker with water, add rinsings to the volumetric flask and make up to volume. Mix the contents and filter. To 20 ml of the filtrate in a tared platinum dish, add 2 ml of sulfuric acid TS, dilute, evaporate to dryness and ignite to constant weight. The residue does not exceed 20 mg.

Asbestos

Free from asbestos as demonstrated by the test for amphiboles and serpentines
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

Asbestos

The presence of amphiboles and of serpentines is revealed by infrared absorption or by X-ray diffraction (see A and B). If detected, the presence of asbestos is confirmed by optical microscopy.

A. An absorption band at 758 ± 1 cm^{-1} in the infrared spectrum of a potassium bromide dispersion of the material remaining after ignition of the substance at 850^{o} for at least 30 min, indicates the presence of tremolite, an amphibole. Absorption bands or shoulders between 600 and 650 cm^{-1} may indicate serpentines.
B. An X-ray powder diffraction pattern exhibiting diffraction peaks at 10.5 ± 0.1o 2θ indicates amphiboles. Peaks at 24.3 ± 0.1o 2θ and 12.1 ± 0.1o 2θ indicate serpentines.

If amphiboles or serpentines are indicated, examine the sample using optical microscopy to confirm the presence of asbestos. Asbestos is confirmed if the following criteria are met:

- a range of length to width ratios of 20:1 to 100:1, or higher for fibres longer than 5 m,
- capability of splitting into very thin fibrils,
- and if 2 or more of the following 4 criteria are met:
- parallel fibres occurring in bundles,
- fibre bundles displaying frayed ends,
- fibres in the form of thin needles,
- matted masses of individual fibres and/or fibres showing curvature