

## SHELLAC, BLEACHED

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### SYNONYMS

INS No. 904

### DEFINITION

Shellac is a polyester resin obtained from lac, the resinous secretion of the insect *Laccifer (Tachardia) lacca* Kerr (Fam. *Coccidae*). Bleached shellac is obtained by dissolving the lac in aqueous sodium carbonate, followed by bleaching with sodium hypochlorite, precipitation of the bleached lac with dilute sulfuric acid solution, and drying; wax-free bleached shellac is prepared by further treatment whereby the wax is removed by filtration.

C.A.S. number

9000-59-3

### DESCRIPTION

Bleached shellac: off-white to tan, amorphous granular resin; wax-free bleached shellac: light yellow, amorphous, granular resin

**FUNCTIONAL USES** Coating agent, glazing agent, surface finishing agent

### CHARACTERISTICS

#### IDENTIFICATION

##### Colour reaction

To 50 mg of the sample add a few drops of a solution of 1 g ammonium molybdate in 3 ml of sulfuric acid. A green colour is produced, changing to lilac when the solution is neutralized with 6 N ammonium hydroxide.

##### Solubility (Vol. 4)

Insoluble in water; freely (though very slowly) soluble in ethanol; slightly soluble in acetone and ether

##### Acid value

Between 60 and 89  
See description under TESTS

#### PURITY

##### Loss on drying (Vol. 4)

Not more than 6% (40°, 4 h, then room temperature over silica gel, 15 h)

##### Rosin

Dissolve 2 g of the sample in 10 ml of dehydrated ethanol, and add slowly, with shaking, 50 ml of solvent hexane. Transfer to a separator, wash with two 50-ml portions of water, and discard the washings. Filter the solvent layer, evaporate it to dryness, and to the residue add 2 ml of a mixture of 1 volume of liquefied phenol and 2 volumes of methylene chloride. Stir and transfer a portion of the mixture to a cavity of a colour-reaction plate. Fill an adjacent cavity with a mixture of 1 volume of bromine and four volumes of methylene chloride, and cover both cavities with an inverted watch glass. No purple or deep indigo blue colour is produced in or above the liquid containing the sample residue.

Wax Bleached shellac: not more than 5.5%; wax-free bleached shellac, not more than 0.2%  
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 method described in Volume 4, "Instrumental Methods".

## TESTS

### IDENTIFICATION TESTS

Acid value Dissolve about 1 g of finely ground sample, accurately weighed, in 50 ml of alcohol previously neutralized to phenolphthalein with sodium hydroxide, and titrate with 0.1 N potassium hydroxide. Determine the end point using phenolphthalein TS or a potentiometer. If phenolphthalein is used, titrate until the pink colour persists for at least 30 sec. Calculate the acid value by the formula  $56.1V \times N/W$ , in which V is the exact volume, in ml, N is the exact normality of the sodium hydroxide solution, and W is the weight, in g, of sample taken, calculated on the dry basis.

### PURITY TESTS

Wax Transfer about 10 g of finely ground sample, accurately weighed, and 2.5 g of sodium carbonate to a 200-ml tall-form beaker. Add 150 ml of hot water, immerse the beaker in a boiling water bath, and stir until the sample is dissolved. Cover the beaker with a watch glass, heat for 3 h without agitation, and cool in a cold water bath. When the wax has floated to the surface, filter the mixture through medium-speed quantitative ashless filter paper, transferring the wax to the paper, and wash the filter with water. Pour 5 to 10 ml of ethanol onto the filter to accelerate drying. Wrap the paper loosely in a large piece of filter paper, bind with a piece of fine wire, and dry with the aid of gentle heat. Extract with chloroform in a suitable continuous extraction apparatus for 2 h, using a previously dried and accurately weighed flask to receive the extracted wax and solvent. Evaporate the solvent, dry the wax at 105° to constant weight, and calculate the percentage of wax.