

Cashew Nut shell liquid (CNSL)

The pericarp of the nut consists of a coriaceous epicarp, spongy mesocarp and stony endocarp. The kernel covered with testa membrane is contained in a shell 1/8 inch thick. The mesocarp consists of a honeycomb network of cells containing a viscous liquid called cashew nut shell liquid (CNSL), which provides a natural protection to the kernel against insects. CNSL is a valuable raw material for a number of polymer based industries like paints and varnishes, resins, industrial and decorative laminates, brake linings and rubber compounding resins. CNSL is traditionally obtained as a byproduct during the isolation of kernel. The major constituent of shell oil is cardanol and anacardic acid of which cardanol is separately extracted and used in many industries. The shell oil was used as a preservative for boats and nets and to protect wood from termites. It is now largely exported and used in the manufacture of plastics, indelible inks, water proofing composition and other industrial products.



Extraction of CNSL

The extraction of CNSL involves various methods viz. hot oil bath, expellers, kiln method, solvent extraction etc, the most common method being hot oil bath. In this method the raw nuts are passed through a bath of CNSL itself by which the CNSL is extracted. This method extracts only 50% of liquid contained in nuts. Then through expellers about 90% of liquid can be extracted.

Uses of cashew nut shell liquid (CNSL)

The cashew nut shell contains a viscous and dark liquid, known as cashew nut shell liquid (CNSL), which is extremely caustic. It is contained in the thin honeycomb structure between the soft outer skin of the nut and the harder inner shell. The CNSL content of the raw nut varies between 20 and 25 percent. Cashew nut shell liquid (CNSL) is an important and versatile industrial raw material. There are more than 200 patents for its industrial application, in particular, its use as raw material for phenolic resins and friction powder for the automotive industry (brake linings and clutch disks). In drum-brake lining compounds, cashew resins are used as fillers and may also be used as binders. In disc pads, the role of cashew resin is restricted to the use of friction dust as filler. The advantage of the cashew resins compared with synthetic phenolic resins is that they are more economical and produce a softer material, which gives a quieter braking action (CTCS, 1993).

CNSL is also used in mouldings, acid-resistant paints, foundry resins, varnishes, enamels and black lacquers for decorating vases and as insecticides and fungicides. In tropical medicine, CNSL has been used in treating leprosy, elephantiasis, psoriasis, ringworm, warts and corns. Like cashew nuts, CNSL also has an excellent international market and its imports have reached almost US\$10 million annually, corresponding to the sale of the raw liquid. However, the

exporting country would earn much more foreign currency if manufactured products were exported.

After extracting the CNSL, the cashew nut shells can be burned to provide heat for the decorticating operation or can be used in the manufacture of agglomerates. Together with the testa, it may be used either in the manufacture of dyestuff or to provide durability to hammocks or fishing lines.

Cashew shell charcoal

The remains of shell after the extraction of CSNL is called shell charcoal. This is used as a fuel. The shell charcoal is used in processing of cashew for drying after shelling.

