

CHEMISTRY OF GUM ARABIC. Gum arabic is the dried gummy material obtained from the acacia tree which grows in Arabia, Senegal, Egypt, India, and Sudan (formerly Anglo-Egyptian Sudan.) Most of the gum arabic used in lithography comes from Sudan. It is gathered from the trees by natives, separated from the bark and sand, graded, and packed for shipment. Usually the natives make two pickings of the gum from the trees. The gum from the first picking is apt to be "green" and may form a "stringy" gum solution when dissolved in water. Stringy gum arabic solutions are very undesirable in lithography either for desensitizing etches or for deep-etch coating solutions. Often a lot of gum arabic, which makes a "stringy" solution when dissolved in water for a few days, will lose this property if the solid gum is allowed to age for several months before it is dissolved in water.

Chemically, gum arabic is usually said to be a mixture of the calcium, potassium, and magnesium salts of "arabic acid" plus some free arabic acid. William H. Martin analyzed the metallic ions present in gum arabic by the use of an emission spectrograph ("Two Rapid Methods for the Analysis of Metallic Ions in Gum Arabic," *Proceeding of Third Annual Meeting, Technical Association of the Graphic Arts*, 1951, pages 21-28). He found several metals present in trace amounts, but only calcium and magnesium were found in any quantity. An average sample of gum arabic contained about 0.70% of calcium and 0.60% of magnesium, based on a dried sample.

Gum arabic falls in the class of non-crystalline carbohydrates (see "Chemistry of the Compounds of Carbon," pages 93-94) with a formula $(C_6H_{10}O_5)_n$, where "n" is a large number. When gum arabic is boiled with dilute sulfuric acid, it is converted into a sugar called galactose.