



COLONY GUMS
Hydrocolloid & Stabilizer Systems

Gum Tragacanth





Gum Tragacanth

SOURCE & PROCESSING

Gum Tragacanth is the dried, gummy exudation obtained from *Astragalus gummifer* or other Asiatic species of *Astragalus*. This plant is a small, low, bushy perennial shrub having a large tap root, which, along with the branches, is tapped for the gum.

The plants grow wild in the dry deserts and mountains of Asia Minor, Iran, Syria, and Turkey. Iran is the largest exporter and supplies the best quality. The plants are tapped by making careful longitudinal incisions in the tap root and the bark of the branches. The gum exudes readily from these cuts in the form of ribbons or flakes, which become brittle on drying. The plants require an abundance of water during the growing season, but need a dry climate during the collecting time, which extends from April to September for ribbons and from August to November for flakes. Collections are first brought to trading centers and then to wholesale markets where they are hand sorted, graded, packed, and shipped.

SOURCE

The dried, gummy exudation obtained from *Astragalus gummifer* or other Asiatic species of *Astragalus*.

QUALITIES

- ~ High Viscosity
- ~ Very Long Shelf Life
- ~ Suspending Action
- ~ Emulsifying Properties
- ~ Stability to Heat and Acidity

USES

- ~ Pharmaceutical
- ~ Cosmetics
- ~ Industrial
- ~ Food

USES

The uses of Tragacanth are dependent on high viscosity at low concentration, suspending action, stability to heat and acidity, effective emulsifying properties, and extremely long shelf life.

Pharmaceutical and Cosmetics

Tragacanth is used in a wide variety of medicinal emulsions, jellies, syrups, ointments, salves, lotions, and creams as a thickener, emulsifier and lubricant. By increasing the viscosity of the external phase, the gum suspends and prevents the active ingredients from settling out. Tragacanth is used in cod liver oil emulsions to facilitate the absorption of poorly soluble substances, such as steroid glycosides and fat-soluble vitamins. It is also used in low-calorie elixirs and syrups. Tragacanth acts as a suspending agent in various toothpastes to form a creamy, brilliant product. Its long shelf life and film-forming properties make it useful in hair lotions, and hand lotions and creams.

Industrial

Tragacanth has been used in textile print paste and sizes for high quality silks and crepes. It has good release properties and gives added body to these fabrics. It is also used in dressing leather and in the preparation of leather polishes. In addition, it is used in furniture, floor, and auto polishes. It has been used as an adhesive for reconstituted cigar wrapper leaves as well.

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PROPERTIES

Physical

The gum exudate varies in quality from long, thin white ribbon to a coarse, yellow-tan ribbon. Powder made from ribbon is white to light yellow in color, odorless, and has an insipid, mucilaginous taste. The flakes vary from yellow tan to brown to give yellowish white to tan powders. Both ribbon and flake gums are available in a variety of particle sizes and viscosities depending on the end uses.

Solubility

Tragacanth swells rapidly in either cold or hot water to a viscous colloidal sol or semi-gel, which acts as a protective colloid and stabilizer. While it is insoluble in alcohol and other organic solvents the gum can tolerate small amounts of alcohol or glycols. Tragacanth solutions are acidic in the pH range of 5-6. It is fairly stable over a wide pH range down to extremely acidic conditions of about pH 2.

Viscosity

The viscosity is the most important factor in evaluating Tragacanth and is regarded as a measure of its quality as well as a guide to its behavior as a suspending agent, stabilizer, or emulsifier. The viscosity of 1% solutions may range from about 100 to 3500 centipoise depending on the grade. The solution viscosity reaches a maximum in 24 hours at 25° Celsius, 8 hours at 40° Celsius, and 2 hours at 50° Celsius. The maximum initial viscosity of Tragacanth solutions is at pH8, but maximum stable viscosity is about pH 5. Its viscosity is quite stable over a wide pH range.

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Colony's strict standards for color, purity, and viscosity are applied to every batch purchased for our mills. After approval, the exudate are pulverized to a fine mesh powder. Selective sifting, aspirating, and density-table separating are used during this powdering to remove impurities. The preferred medium for conveying the gum is clean, filtered air, which acts to cool the powder and to prevent viscosity loss. The final powder is blended to ensure uniformity of color, mesh size, and viscosity. The gum is further processed to conform to sterility standards, when required, to assure customer satisfaction for a product to fit their exacting needs.

Food

Because of its relative stability to heat, acidity, and aging, Tragacanth is widely used as a thickener and stabilizer in pourable salad dressings of the regular and low calorie types. For similar reasons, it is used in relish sauces, condiment bases, sweet pickles, liquors, and mayonnaise. It is used at about 0.4-0.75% in the above products. Tragacanth provides clarity and brilliance to frozen pie fillings and toppings in which suspended fruit, fruit purees and flavors are used. The gum gives good shelf life to these acidic products.

Tragacanth improves the shelf life and reduces syneresis when used as a cold process stabilizer for meringues. In combination with gum Arabic, Tragacanth produces a superior bakery flavor emulsion. In citrus beverages, Tragacanth acts as a thickening agent to impart proper mouth feel and stability. Since the gum has good acid resistance, it has been used in candy cream centers containing natural fruit and acid. It has also been used as a binder in the cold-press process and the extrusion process for making candy cigarettes, and lozenges.



Chemical Characteristics

Tragacanth consists of two fractions. Tragacanthin dissolves to give a colloidal hydrosol. Bassorin, representing 60-70% of the gum, is insoluble and swells to a gel. Chemically, tragacanthin is a complex mixture of acidic polysaccharides containing D-galacturonic acid, D-galactose, L-fucose (6-deoyl-L-galactose), D-xylose, and L-arabinose. Bassorin is probably a methylated tragacanthin. A small amount of cellulose, starch, protein, and ash are present. Calcium, magnesium and potassium are the cations associated with Tragacanth. The molecular weight of the gum is 840,000 and the molecules are elongated (4500Å by 19Å) and this accounts for its high viscosity. Moisture content varies from about 9 to 13%.

Compatibility

Tragacanth is compatible with other plant hydrocolloids as well as carbohydrates, most proteins, and fats. Viscosity is most stable at pH 4 to 8 with very good stability at higher pH as well as down to pH 2. The addition of strong mineral and organic acids cause some drop in viscosity. However, it is one of the most resistant gums and is chosen for use under highly acidic conditions. Divalent and trivalent cations can cause a viscosity drop.

Preservatives

Tragacanth is similar to other plant hydrocolloids that are subject to bacterial attack. Glycerol or propylene glycol, at 94 ml/liter, serves as excellent preservatives in many emulsions. Benzoic acid or sodium benzoate at less than 0.1% concentration is effective when used below pH 6. A combination 0.17% methyl and 0.03% propyl parahydroxybenzoates is effective at pH 3 - 9.

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in service, innovation and quality.*



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