

Guar Gum and Locust Bean Gum (alias carob gum)

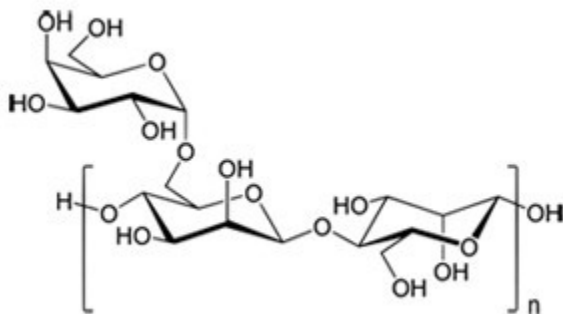
Guar Gum vs. Locust Bean Gum (alias carob gum)-- both are member of the galactomannan family

What are Galactomannans?

Galactomannans are polysaccharides consisting of a mannose backbone with galactose side groups (more specifically, a (1-4)-linked beta-D-mannopyranose backbone with branchpoints from their 6-positions linked to alpha-D-galactose, i.e. 1-6-linked alpha-D-galactopyranose). Both Guar Gum and Locust Bean Gum are galactomannans. Galactomannans are used in foods as stabilisers.

The number of side units per unit length of the monosaccharide chain is known as the degree of substitution (DS). The more substitution, the more the chains are held apart from each other. Because this prevents them from forming hydrogen bonds, they hydrate more quickly. Both guar gum and xanthan gum are galactomannans, but locust bean gum is highly unevenly substituted. As a result, locust bean gum is not cold-water soluble - it will swell somewhat in cold water - while guar gum is cold-water soluble. This structure also allows locust bean gum to form a synergistic gel with xanthan gum and to moderate the brittle gel produced by kappa carrageenan. Guar does not have these effects.

Guar Gum Molecule



Guar Gum Molecular Structure

CHEMICAL COMPOSITION

The backbone is a linear chain of β -1,4-linked mannose residues to which galactose residues are 1,6-linked at every second mannose, forming short side-branches.

SOLUBILITY AND VISCOSITY

Guar Gum hydrates fairly rapidly in cold water to give highly viscous pseudoplastic solutions of generally greater low-shear viscosity when compared with that of locust bean gum. Above 80°C the final viscosity is slightly

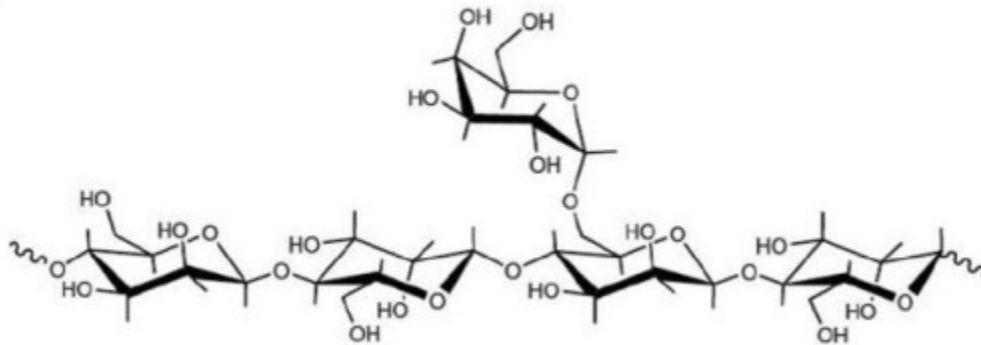
reduced.

USES

Guar gum is used for thickening cold and hot liquids, to make hot gels, light foams and as an emulsion stabilizer. Guar gum can be used in combination with it, but xanthan gum which will work more quickly. Guar gum is used in ice cream to improve texture and reduce ice cream meltdown

Locust Bean Gum(alias carob gum)

locust bean molecule



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The backbone is a linear chain of 1,4-linked mannose residues to which galactose residues are 1,6-linked at -- about 3.5 (2.8 - 4.9) mannose residues for every galactose residue. every second mannose, forming short side-branches.

SOLUBILITY AND VISCOSITY

Locust bean gum is less soluble and lower viscosity than guar gum as it has fewer galactose branch points. Locust Bean Gum is incompletely soluble in cold water, and must be heated for maximum solubility. The highest viscosity is obtained by dispersing the gum into 95°C water and then cooling.

USES

Locust bean gum is used as a thickening agent and gelling agent in many food applications such as fresh dairy, frozen dairy, condiments and processed fruit & vegetables. Locust bean gum has a neutral taste, consumer preferred texture, and can improve viscosity. LBG is used in ice cream to improve texture and reduce ice cream meltdown.