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TECHNICAL INFORMATION

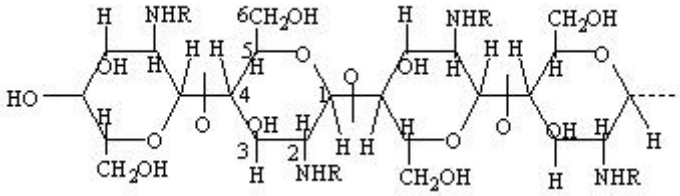
Catalog Number: 150597

Chitosan

A cationic marine polymer derived form the shells of crustaceans (e.g., crabs)

MP's chitosan is a partially de-acetylated chitin formed by the reaction of chitin with concentrated alkali. A brief description of chitin will help you understand the nature of chitosan. Chitin is a high molecular weight linear polymer of anhydro-N-acetyl-glucosamine. Chitin occurs in nature as part of the protective coating of some invertebrates.

The chemical structure of chitin is , (where R is the acetyl CH_3CO-group)



The chemical structure of chitosan. When part of the R (CH3Co) group is replaced by H (it becomes an amide-NH2)

The availability of this nature endowed ploymer opens up many interesting possibilities of applications where a high molecular weight cationic polymer is suitable. Chitosan polymer is biodegradable, with low toxicity, if any.

General Characteristics of Chitosan

Appearance:	Pale white to slightly pink grainy powder
Grain Size:	Less than 3 mm
Apparent Specific Weight:	0.15 + 0.05
Moisture Content:	Less than 10%
Alkali Soluble and Ash Contents:	Less than 5%
Solution color:	Clear
Average Molecular Weight:	100,000 - 300,000 g/mole
$-NH_2$ Content:	7-10% (~90% deactylation)
Viscosity	
1% with 1% HAc:	2,000 to 3,000 cp
0.5% with 0.5% HAc:	200 to 500 cp

Certain variation in properties is unavoidable, as the molecular weight of the "natural" marine polymer is dependent on the kind and age of crustaceans from which it is derived.

Solubility :

In Organic Acids -

Chitosan is soluble at 1% in 1% acetic, adipic, formic, lactic, malic, propionic, or succinic acid. Formic acid has proved to be a good solvent over the entire acid concentration range from 0.25 to 50%, although at the extremes of this range, solutions contain gel particles.

In Inorganic Acids:-

Solubility in "mineral" acids is limited. It is soluble only within the acid concentration range from 0.15 to 1.1%. It is insoluble in phosphoric, or sulfuric acid. Chitosan is insoluble in neutral or alkaline media. To be effective, Chitosan must first be dissolved into an aqueous solution. In applications additional acids may be needed to maintain pH below7 or Chitosan will precipitate out.

Solution Preparation :-

As an example, for a 1% solution , disperse 1 gram of Chitosan in 50 ml of water with a high-speed stirrer, and while agitation is continuing, add 50 ml 2% acid. Stir for 30 minutes or until dissolution is complete.

Also soluble in dilute acetic acid. Insoluble in sulfuric acid.