

Chitin and Chitosan

Chitin (*pronounced khaetin*) is a natural polysaccharide found in the shells of crabs, lobsters and shrimp. Until new uses were found for these shells, they were simply a problem for waste disposal. In the 1970s it was found that there were many and varied uses for the Chitin extracted from these shells especially for biomedical applications ranging from administering drugs to patients through slow and metered release of the active ingredients to fiber production. The fibers produced have natural antibacterial properties without any antigen-antibody reaction and can even aid healing when used as wound dressings or "artificial skin".

What is Chitosan?

Chitosan (*pronounced khaetosan*) is the carbohydrate biopolymer (polysaccharide) of glucosamine produced commercially by deacetylation of chitin, a compound of natural origin obtained from the exoskeleton of crustaceans (crabs, shrimp, lobsters, squids, etc.).

After cellulose, chitin is the second most abundant natural biopolymer found in nature, with a chemical structure very similar to that of cellulose.

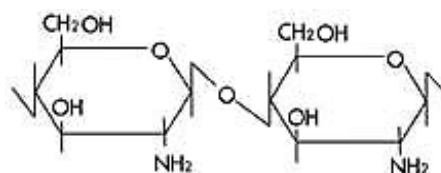


Advantages of Chitosan:

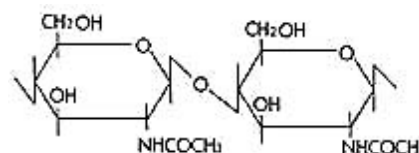
- ⇒ Non- toxic
- ⇒ Abundant on earth
- ⇒ Totally biodegradable
- ⇒ Scientifically proved biocompatible
- ⇒ With effective antibacterial properties



Chemical Structures of Chitin and Chitosan:



Chitin



Chitosan

General Applications of Chitosan

Wastewater treatment	Removal of metal ions
Medical	Acceleration of wound healing Control released of drugs Fat removal for weight loss
Textile industry	Inhibition of bacterial growth High humidity absorption Comfort and soft texture

Antibacterial Mechanism of Chitosan

Chitosan molecule reacts with the bacterial cell surface, alters cell permeability and prevents the entry of material or causes the leakage of material. It acts as a chelating agent that selectively binds trace metals and thereby inhibits the production of toxins and microbial growth. It also activates several defense processes in the host tissue, acts as water binding agent and inhibits its various enzymatic reactions.

Antimicrobial Tests Provided by SGS

<i>Quantitative test</i>	<i>Qualitative test</i>
JIS L1902: Textile with antimicrobial treatment AATCC 100: Textile with antimicrobial treatment JIZ Z2801: Antimicrobial treated products other than textile	AATCC 147: Textile with diffusible antimicrobial agents AATCC 30: Textile with antifungal activity ASTM D4576: Mold resistant to leather

If you are interested in the services provided for Chitosan testing, please kindly contact us and we will provide you with more information.

For enquiries:

Global Competences Support Centre, gcsc@sgs.com

Ruth HON

☎ + 852 2774 7148 or ✉ : ruth.hon@sgs.com

Asia – Hong Kong Tel: +852 2334 4481 Fax: +852 2144 7001 ✉ mktg.hk@sgs.com
 Australasia – Perth Tel: +61 (0) 3 9790 3418 Fax: +61 (0) 3 9701 0988 ✉ au.cts@sgs.com
 Europe – London, UK Tel: +44(0) 20 8991 3410 Fax: +44 (0) 20 8991 3417 ✉ gb.cts.sales@sgs.com
 Africa & Middle East – Turkey. Tel: +90 212 225 0024 Fax: +90 212 296 47 82 ✉ sgs.turkey@sgs.com
 Americas – USA. Tel: +1 973 575 5252 Fax: +1 973 575 1193 ✉ Marketing.CTS.US@sgs.com
 Web: www.sgs.com Global Competences Support Centre: ✉ gcsc@sgs.com
 If you wish to unsubscribe to this technical bulletin, go here: [Unsubscribe](#)

Application of Chitosan in Textile Industry

Chitosan has been widely used in the textile industry over the past decade. Textiles with Chitosan finishing have been employed in a variety of consumer products including household linen, sportswear and undergarments. Fibers blended with Chitosan perform long lasting antibacterial properties, regardless of the number of washes or other external actions. Furthermore, fabric pretreated with Chitosan can improve the physical appearance of textiles leading to better and softer texture.

With the interest towards Chitosan, SGS, as a leading testing laboratory, is developing testing methods to detect the presence of Chitosan content in textile materials. Besides which, we also provide well developed antimicrobial testing services to evaluate the antibacterial activity and efficacy of your antimicrobial treated textile products.

© 2007 SGS. All rights reserved. This is a publication of SGS, except for 3rd parties' contents submitted or licensed for use by SGS. SGS neither endorses nor disapproves said 3rd parties contents. This publication is intended to provide technical information and shall not be considered an exhaustive treatment of any subject treated. It is strictly educational and does not replace any legal requirements or applicable regulations. It is not intended to constitute consulting or professional advice. The information contained herein is provided "as is" and SGS does not warrant that it will be error-free or will meet any particular criteria of performance or quality. Do not quote or refer any information herein without SGS's prior written consent.