

Chitin & Chitosan

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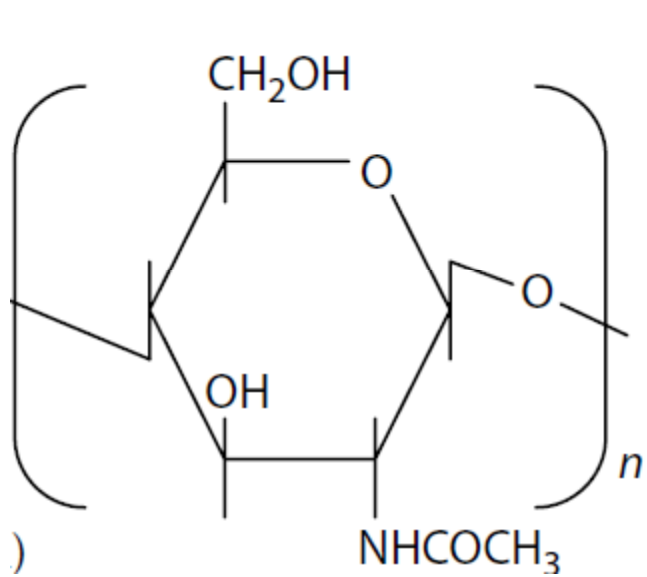
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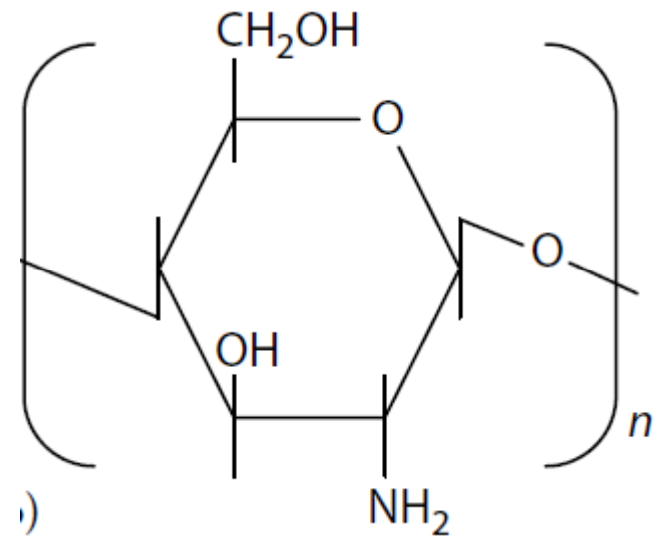
Introduction

Chitin is a copolymer of N-acetyl-d-glucosamine

The deacetylated form of chitin refers to chitosan



Chitin



Chitosan

Introduction ...

- Chitin and chitosan are found as supporting materials in many aquatic organisms, terrestrial organisms, and some microorganisms
- Among the terrestrial organisms, silkworms, honeybees, and mushrooms have been cultured in industrial scale to produce valuable products
- Chitin in terrestrial crustaceans is associated with calcium carbonate, proteins, lipids, and pigments

Methods of Extraction from Marine Sources

The isolation of chitin from shellfish waste consists of three steps:

- **Deproteinization**
- **Demineralization and**
- **Decolorization**

Chitin is further deacetylated (DA) to make chitosan

Methods of Preparation

- Proteins are first removed from ground shells by treating with mild sodium hydroxide or potassium hydroxide solution at elevated temperature.
- Alkali concentrations usually between 1% and 10% with temperatures ranging from 30°C to 100°C
- The removal of calcium carbonate, calcium phosphate, and other mineral salts found in shell waste is accomplished by extraction with dilute acids.

Methods of Preparation

Shellfish waste (crab, shrimp, krill, etc.)

Grinding ↓

Deprotonization with NaOH/KOH

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Demineralization with HCl

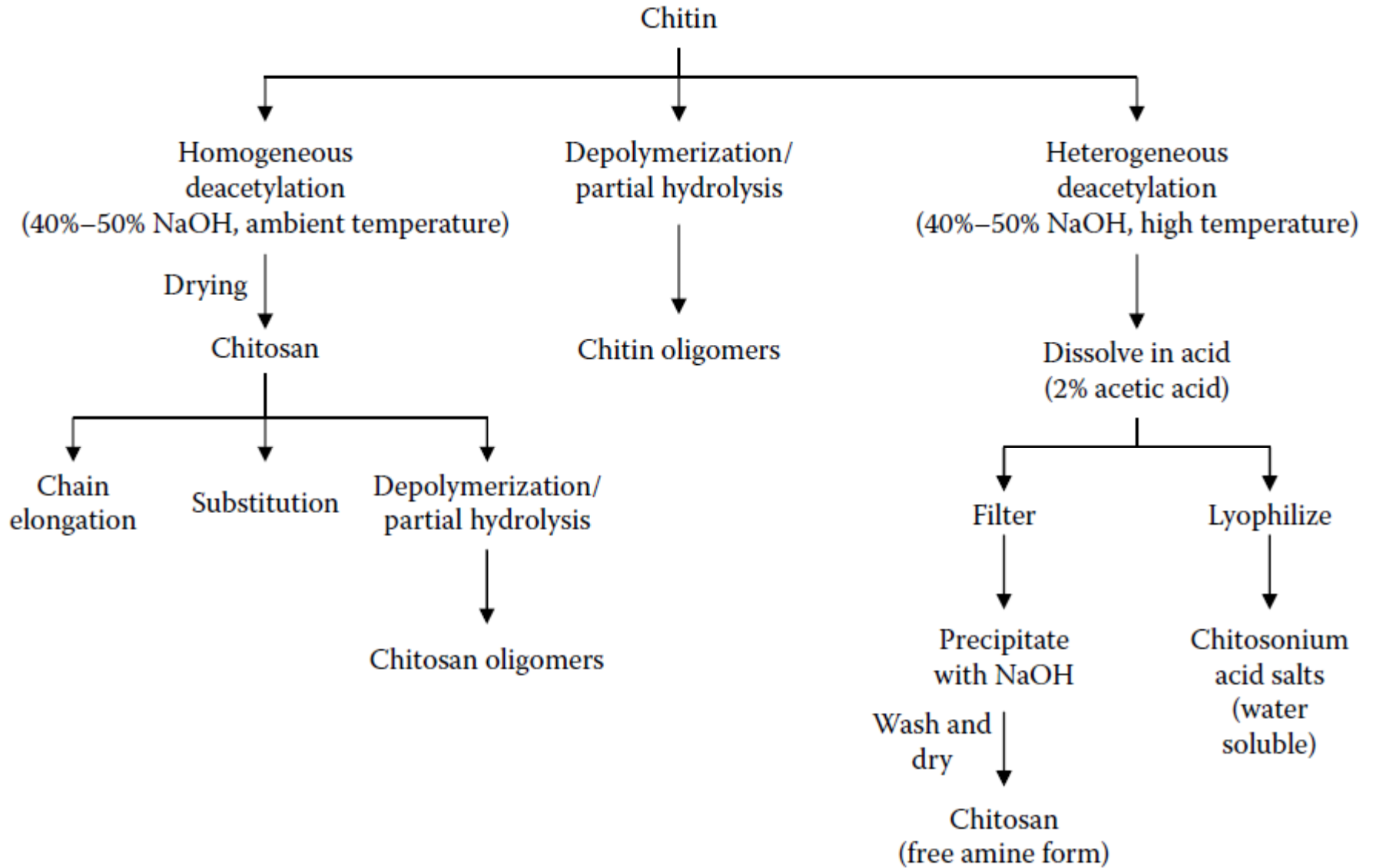
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Decoloration

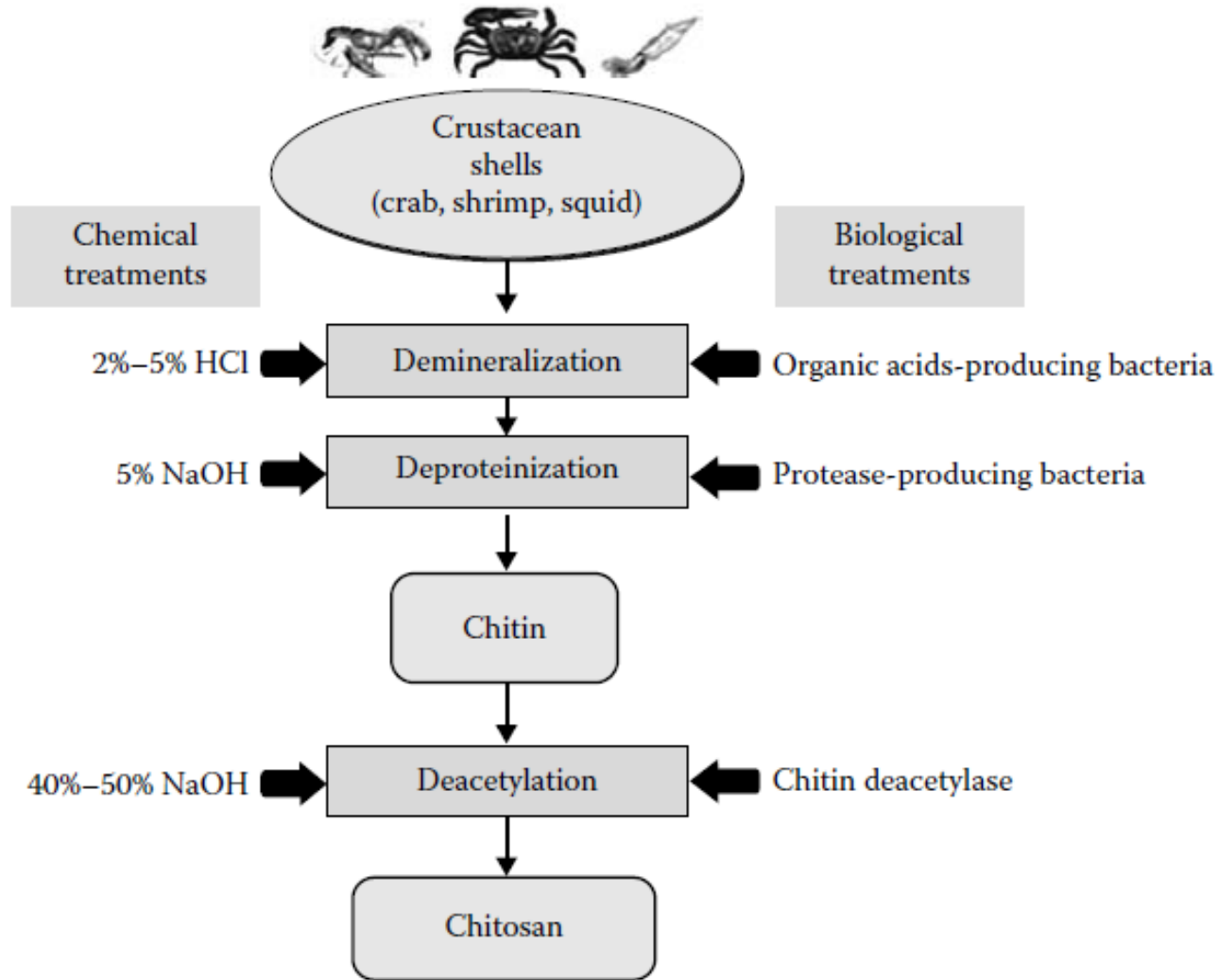
Drying ↓

Chitin

Methods of Preparation



Methods of Preparation



Review Questions

1. Which of the following degradation is responsible
Biodegradation of plastics ?

- (a) Oxidative degradation (b) Hydrolytic degradation
(c) Photo degradation (d) Thermal degradation

2. PLA is produced by _____

- (a) Addition polymerisation (b) Condensation polymerisation
(c) Coordination polymerisation (d) Ring opening polymerisation

3. PHA resembles _____ in most of the properties

- (a) PE (b) PP (c) PET (d) PBT

4. Thermoplastic starch can be processed by_____.

- (a) Injection moulding (b) Extrusion moulding
(c) Blow moulding (d) All the above

5. The Bacteria *Wautersia eutropha* is used for the production of

- (a) PHB (b) PLA (c) Lactide (d) Protein

6. Trade name of PHB is _____

- (a) Biomes (b) Biopol (c) Biomax (d) Ecovio