Experiment C: Chitosan from Chitin by Alkalyne Hydrolysis

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| **Source:** |

According to Bader, Birkholz, Chitin Handbook, R.A.A. Muzzarelli and M.G. Peter, eds., European Chitin Society. 1997. ISBN 88-86889-01-1, with additions

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| **Equipment:** |

Round-bottomed three-necked flask (250 ml, two NS 14, one NS 29), connector (cone to hose coupling), reflux condenser, ground-glass thermometer (NS 14), heating coil, magnetic stirrer, stirring rod, balloon, water pump, suction flask, porcelain nutsch filter (Ø 9 cm), filter paper, crystallization dish (Ø 14 cm), drying oven, balance

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| **Reagents and materials:** |

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| **Reagents and materials:** | **H-Phrases** | **P-Phrases** | **Danger symbol** |
| Sodium hydroxide solution (w=50%) | 314, 290 | 280, 301, 303, 305, 309 | C |
| Chitin |  |  |  |

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| **Procedure:** |

**![j0346317[1]]() Do not forget safety glasses, safety gloves and lab coat!**

In a round-bottomed flask 150 ml sodium hydroxide solution are added to 2 g of chitin. The apparatus closed air-tightly with a balloon (the literature recommends working with a protection gas (Nitrogen). For school purposes, this can be done without). With backflow and under stirring, the mixture is heated at 125°C for one hour. The mixture is allowed to cool down and then 100 ml of water are added. The next day the mixture is filtered off and the residue is washed with water to neutral reaction and dried in the oven at 60°C.

**Remark:** The ground joint has to be well-greased (possibly using teflon hulls)!

**** Mother liquor and washing water are neutralized and poured down the sink.

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| **Observation:** |

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| **Analysis: (**Pictures of the formulas created with Chemdraw) |

The obtained Chitosan is a dim pink-beige coloured, fluffy substance very similar to Chitin. 2 g of Chitin yield 1,5 g of Chitosan.



Chitosan: Poly-β-1,4-D-glucosamine

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| **Source of errors:** |

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| **Links:** |