Experiment B: Chitin from Crab Shells

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| **Source:** |

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

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| **Equipment:** |

Beaker (400 ml), strainer (mesh size 3-4 mm), magnetic stirrer with heating plate, stirring rod, crystallization dish (Ø 14 cm), drying oven, balance, mortar with pestle, suction flask (500 ml), porcelain nutsch filter (Ø 9 cm)

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| **Reagents and materials:** |

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| **Reagents and materials** | **H-Phrases** | **P-Phrases** | **Danger symbol** |
| Sodium hydroxide solution (w=2%) | 314, 290 | 280, 301, 303, 305, 309 | Datei:GHS-pictogram-acid.svg |
| Hydrochloric acid (w=7%) |  |  |  |
| Crab shells |  |  |  |

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| **Procedure:** |

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

**1st step: coarse purification**

150 g of crab shells are coarsely cleaned with water by stirring the broken shells in a 400 ml beaker with water for a few minutes. After this, the shells are filtered off. This process is repeated until sand and other soil are removed. The precleaned crab shells are dried overnight in the drying oven at 80°C.

**2nd step: Protein removal**

15 g of the dried shells are grinded in a mortar and transferred to a beaker. Then 250 ml of sodium hydroxide solution are added and the mixture is heated under stirring at 60-70°C for half an hour. The shells are filtered off with a strainer and the process is repeated. The filtrate should almost be clear and colorless. Then the shells are washed with demineralized water til neutral reaction. For time-saving the shells may be soaked in sodium hydroxide solution overnight after the first sodium hydroxide treatment, then filtered off and washed.

**3rd step: Calcium carbonate removal**

250 ml of hydrochloric acid are slowly added to the shells and the mixture is stirred at room temperature until no gas escapes anymore. As a check, 10 ml of hydrochloric acid are added. If no further generation of gas occurs, the mixture is filtered off and washed neutral with water. The product is dried overnight in the oven at 60°C.

**** Sodium hydroxide solution and hydrochloric acid are neutralized and poured down the sink.

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| **Observation:** |

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

The obtained Chitin is a dim pink-beige coloured, fluffy substance. 15g of pre-cleaned crab shells yield 3 g of chitin.

 Chitin: Poly-β-1,4-N-acetyl-D-glucosamine