

## PREPARATION AND NMR CHARACTERIZATION OF N-TRIETHYL CHITOSAN

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**PURPOSE.** Chitosan and its derivatives have been used as an enhancer, but poor solubility of Chitosan reduces its potential power to work as an enhancer.

Chitosan is only soluble in acidic solution with pH values lower than 6 and loses its charge in pH>6, therefore it will be Insoluble in aqueous media. Synthesize of quaternary derivatives of chitosan to improve solubility in wide pH range for increasing its potential as an enhancer has been investigated. N- triethyl Chitosan is a derivative of Chitosan with a rather high degree of substitution and solubility.

**METHODS.** To prepare TEC, 200 mg Chitosan and 1.15 ml of Ethyl Iodide and 1.1ml NaOH 15% were added to 8 ml of 1-Methyl-2-Pyrrolidone and heated at 60°C for 1 hour. The product was precipitated by ethanol and separated by centrifugation, then washed by ether.

Precipitated product was mixed with 1-Methyl-2-Pyrolidone. In second step, 0.9 ml of Methyl Iodide was added to the mixture and stirred at 60°C for 1.5 hours.

Final product could separate by ethanol and washed by excess ethanol to omit solvent.

Effect of changing some parameters such as amount of ethyl iodide, concentration of NaOH solution has been investigated by the factorial design system.

**RESULTS.** Assessment of product was done by NMR. (CH<sub>2</sub>) of ethyl group in tri ethyl and diethyl chitosan was assigned in 1-1.2ppm, respectively. The solvent could hide the main peaks of ethyl group; it can be reduced and omitted by washing with excess ethanol after precipitation. Degree of quaternization was calculated by consideration to internal "H" of Chitosan. It can be changed from 13% to 25% by varying parameters.

**CONCLUSION.** H-NMR spectra can be used for assessment of quaternization value of TEC. TEC is a quaternary Chitosan which can be considered as an enhancer and transporter for drug delivery.

### References.

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