

**ULTRASOUND-ASSISTED DEACETYLATION OF
CHITIN: A NEW PROCESS FOR PREPARING
TAYLORED-MADE CHITOSAN**

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The use of high intensity ultrasound irradiation to improve the reactivity of chitin toward its deacetylation is reviewed. The evolution of such a study, from the first approach which aimed the activation of chitin to the more recent developments which allows the proposition of new process for the deacetylation of chitin, is discussed. The effect of cavitation on chitin is discussed taking into account if it is suspended in deionized water or in aqueous sodium hydroxide while it is submitted to ultrasound irradiation. The effects of the ultrasound irradiation on the morphology of the chitin particles and its consequence concerning the deacetylation reaction are discussed.

The influence of the reaction temperature and the ultrasound parameters on the deacetylation efficiency and on the characteristics of the produced chitosans is also discussed.

The data concerning the application of the non-isothermal (NIUSAD) and the isothermal (IUSAD) ultrasound-assisted deacetylation processes to alpha- and beta-chitin are presented and compared to those reported in the literature concerning other routes employed to deacetylate chitin.

From these discussions it will be shown that the ultrasound-assisted deacetylation process (IUSAD and NIUSAD) is a promising route for producing tailored-made chitosan, allowing the preparation of extensively deacetylated chitosan (DA<10%), of high molecular weight ($M_w \approx 1000 \text{ kDa}$) and low polydispersity ($I_p < 1.5$) after a single step reaction carried out at low temperature (60-80°C) for short time (<60min).