

EFFECT OF REFLUX TEMPERATURE ON SYNTHESIS OF CHITOSAN / NANO-HYDROXYAPATITE COMPOSITES

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Dr. S.U.Adikary

ABSTRACT

Effect of reflux temperature on synthesis of Chitosan / nano Hydroxyapatite composite

In this study, effect of reflux temperature for synthesis of chitosan / Nano-hydroxyapatite composites was investigated. Chitosan / Nano-hydroxyapatite composites were synthesized using co-precipitation technique at different reflux temperatures of 30 °C (Room temperature), 70 °C and 90 °C. Chitosan, acetic acid, calcium hydroxide and phosphoric acid were used as starting materials. 70/30 weight ratio of chitosan / Nano-Hydroxyapatite composites was selected for the study. H₃PO₄ / acetic acid / chitosan solution was added at a rate of 3 ml/min using a burette into stoichiometric weight of Ca(OH)₂ solution under vigorous stirring. The pH value of the solution was continuously monitored using a pH meter. The resulting suspension was refluxed and aged for 24 h while being stirred. The precipitate was filtered and washed with distilled water. This procedure was repeated for the selected reflux temperatures. The characteristics of nano hydroxyapatite, ceramic powder / chitosan composite were investigated by Differential Thermal Analysis (DTA), Fourier Transformation Infrared (FTIR) spectroscopy and X-ray diffraction (XRD). Particle size was determined by XRD patterns using Scherrer's equation. It was observed that particle size increases with increasing the reflux temperature. Both the size and shape of HA crystals, SEM images shows that nano HA particles were dispersed in the Chitosan matrix and the surface become rough and more porous.



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	Page
List of Figures	vi
List of Tables	viii
List of abbreviations	ix
1. Introduction	1
1.1 Chitosan	3
1.1.1 Degree of Deacetylation	4
1.1.1.1 Analysis of FTIR Spectrum	5
1.2 Hydroxyapatite	6
1.3 Chitosan / Nano Hydroxyapatite Composite	7
2. Experimental Procedure	8
2.1 Materials	8
2.2 Methodology for Chitosan preparation	8
2.3 Methodology for the preparation of Chitosan / Nano-hydroxyapatite Composite	9
2.4 Methodology of characterization chitosan / Nano HA composites	11
3. Results and discussion	12
3.1 Degree of Deacetylation (DD) of Chitosan	12
3.2 The pH of the Ca(OH) ₂ suspension	13
3.3 Fourier Transformation Infrared (FTIR) spectroscopy Analysis	17
3.4 Thermogravimetric analysis (TGA) and Differential Thermal analysis (DTA)	19

3.5	X-ray Diffractometer Analysis	21
3.6	Scanning Electron Microscopy Analysis	23
4.	Conclusions and Recommendations	25
5.	Reference List	26
6.	Annexure I	29
7.	Annexure II	30
8.	Annexure III	31



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LIST OF FIGURES

Page

Figure 1.1	Penaeus Monodon shrimp shells	3
Figure 1.2	Deacetylation of Chitin	4
Figure 2.1	Process chart of medical Chitosan preparations	9
Figure 2.2	Process of Chitosan / nano HA composite preparation	10
Figure 2.3	Apparatus in setup composite preparation	11
Figure 3.1	Deacetylation of Chitosan	12
Figure 3.2	Two times of Deacetylation of Chitosan	12
Figure 3.3	The process of coprecipitation of Chitosan/HA	13
Figure 3.4	pH variation of the Ca(OH) ₂ suspension during the Addition of chitosan / acetic acid / H ₃ PO ₄ solution	15
Figure 3.5	Infrared spectrums of Chitosan and hydroxyapatite composite, Room Temperature reflux	17
Figure 3.6	Infrared spectrums of Chitosan and hydroxyapatite composite, Reflux temperature 70 °C	17
Figure 3.7	Infrared spectrums of Chitosan and hydroxyapatite composite, Reflux temperature 90 °C	18
Figure 3.8	TGA-DTA curve of chitosan and hydroxyapatite – reflux Room temperature	19
Figure 3.9	TGA-DTA curve of chitosan and hydroxyapatite – reflux temperature 70 °C	20
Figure 3.10	TGA-DTA curve of chitosan and hydroxyapatite – reflux temperature 90 °C	20

Figure 3.11 XRD patterns of chitosan and hydroxyapatite – Room temperature	21
Figure 3.12 XRD patterns of chitosan and hydroxyapatite – reflux temperature 70 °C	22
Figure 3.13 XRD patterns of chitosan and hydroxyapatite – reflux temperature 90 °C	22
Figure 3.14 SEM images of Chitosan / nano HA composite	23



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LIST OF TABLES

Page

Table 2.1 Preparation of Chitosan / Nano-hydroxyapatite composite with Different reflux temperatures	13
Table 3.1 Variation of pH value due to adding of Chitosan solution to Ca(OH) ₂ solution	14
Table 3.2 Variation of pH value due to adding of NaOH solution	14
Table 3.3 Characteristic bands of FTIR spectrums of Chitosan / nano hydroxyapatite Composite from Figure 3.5, 3.6 and 3.7	18
Table 3.4 Weight of Chitosan and HA in composites from TGA and DTA curve	21



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LIST OF ABBREVIATION

Abbreviation	Description
HA	Hydroxyapatite
CS	Chitosan
DTA	Differential Thermal Analysis
TGA	Thermogravimetric analysis
FTIR	Fourier Transformation Infrared
DD	Degree of deacetylation
SEM	Scanning Electron Microscopy
Ca(OH) ₂	Calcium Hydroxide
H ₃ PO ₄	Hydrogen Phosphoric acid
CH ₃ COOH	Acetic acid
NaOH	Sodium Hydroxide
HCl	Hydrochloric acid



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