5. CONCLUSIONS

Deproteinisation of shrimp shell had significant effect on quality of chitin. Amount of alkali used for deproteinisation affects the chitin quality. Higher alkali concentration results deacetylation of chitin, which results reduction in glucosamine hydrochloride yield. Concentration of alkali used for deproteinisation increased the amount of methanol solubles. This is an indication of deacetylation thus chitin prepared with 3% NaOH for 30 minutes was suitable for hydrolysis ie glucosamine hydrochloride production.

Demineralization of shrimp shell also influences chitin quality. Demineralization in less concentrated acid results more ash content in chitin. Higher acid concentration results more deacetylation and depolymerization. Demineralization with 1N Hydrochloric acid for 60 minutes results good quality chitin, which on hydrolysis gives more glucosamine hydrochloride.

Concentration of Hydrochloric acid affects the glucosamine hydrochloride yield. When 38% Hydrochloric acid was used for hydrolysis, the yield was lower than chitin hydrolysis with 32%. Amount of methanol solubles was higher at 38% concentrations Faster glucosamine hydrochloride conversion was observed at higher acid strength and glucosamine hydrochloride obtained had high quality by chitin hydrolysis with 38% Hydrochloric acid. When high quality glucosamine hydrochloride was envisaged, it is better to use 38% Hydrochloric acid for hydrolysis. For medical purposes, chemical purity of hydrochloric acid was not aimed. Thus we can go for hydrolysis with 32% Hydrochloric acid.

1:2 chitin Hydrochloric acid ratio was found to be ideal for chitin hydrolysis. The ratio below this was not sufficient for hydrolysis and 1:3 and 1:4 ratios are unworthy. The ratios above 1:2 should not improve the glucosamine hydrochloride yield. Glucosamine hydrochloride quality was not affected by chitin-acid ratios.

Hydrolysis of chitin at 95°C for 45 minutes gives glucosamine hydrochloride having high purity thus this temperature was recommended for
glucosamine production. At 80°C the conversion was slower and the purity was lesser than other temperatures while, at 100°C the yield obtained was less than other temperatures.

Solvents used for glucosamine hydrochloride affects the final yield and purity. But their quantity varied from solvent to solvent. High quality glucosamine hydrochloride was obtained by purification with methanol followed by ethanol Non glucosamine matter (solubles) obtained from the solvents during purification was also varied. Highest soluble content was obtained from methanol followed by ethanol.

During storage, glucosamine hydrochloride undergoes color change. The change of color intensity was related to the purity of glucosamine hydrochloride. Non-glucosamine hydrochloride matter accelerated browning. During storage maximum color was retained by methanol washed glucosamine hydrochloride followed by ethanol washed sample. It was observed that during Maillard browning all the quality parameters were reduced, but the intensity of quality reduction was minimum for glucosamine hydrochloride purified with methanol.

Methanol solubles are non-glucosamine hydrochloride matters obtained during purification, which contains D-glucosamine units, oligomers, calcium chloride, hydrolyzed protein etc.

Recovery of reusable solvents from spent solvent ranges from 75-95%. Among the solvents used Acetone gives maximum recovery followed by isopropanol and the least from methanol. Reduction in recovery is due to the solubles in this solvent.

Hydrochloric acid was recovered by the concentration of decolorized hydrolysates to the extent of 65 to 70% as an aqueous solution of hydrochloric acid and acetic acid and its strength ranged from 7 - 8 N. Part of this acid can be utilized for the decalcification of prawn shell during chitin production thus the problem of acid waste can be solved in a eco-friendly manner.