INVESTIGATION OF THE EFFECT OF MOLD RELEASING AGENT AND RESIDUAL CALCIUM NITRATE/CALCIUM ION OF NITRILE HIGHER MIL GLOVES TO WET LOOK DEFECT

Weerakon W.M.V.B

(158503 F)

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Department of Chemical and Process Engineering

University of Moratuwa

Sri Lanka

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DECLARATION

I declare that this is my own work and this thesis does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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ABSTRACT

Two types of latex are used in disposable gloves manufacturing as natural latex and synthetic latex. Calcium nitrate (calcium ion) is used as the coagulant and calcium carbonate or calcium stearate is used as the former releasing agent.

In pre leaching of natural latex gloves, protein removal also required other than the calcium nitrate removal and post leaching is necessary to further removal of protein. Effectiveness of leaching depends mainly on - three factors as leaching time, leaching tank condition and leaching temperature. In natural latex gloves, it can be maintained leaching takes place at a higher temperature since natural rubber has a high crystalline temperature. But in synthetic latex gloves manufacturing, it cannot be kept at the leaching tank temperature at higher temperatures since the glove becomes hard since its crystalline temperature is low. If the glove film has high thickness, leaching is difficult. Limitation of water supply and high wastewater treatment costs are the main issues with leaching.

Chlorination is used to modify the disposable glove surface by reducing the tackiness which is a characteristic of rubber. Chlorination reduces the friction between the rubber surface and the other surface which come into contact. There are two types of chlorination as online chlorination and offline chlorination. Online chlorination is done by immersing the glove into a chlorine water tank before removing the glove from the former. At online chlorination, the inner surface of the glove gets smoother. If smoothness of the outside surface also requires, offline chlorination is done as a batch process in chlorinators (a machine like a washing machine). Other than that, chlorine water solution can convert calcium carbonate/ calcium stearate which is used as the former releasing agent to calcium salts. There are some disposable gloves which the chlorination is in complete. Chlorination is used to reduce the tackiness resulted from this incomplete chlorination.

Calcium ion can absorb moisture from the surrounding. If calcium ion remains on the latex glove surface, it gives a wet look by absorbing the surrounding moisture. In the industry, it is called “Oil marks”. The degree of wet look depends on calcium ion concentration and surrounding moisture content. If the glove surface contains a

moisture absorbing material like calcium carbonate or corn starch, wet look is not visible even if the glove surface has a significant amount of calcium ions.

DEDICATION

This thesis is dedicated to gloves stripping girls who get burnt their hands to protect someone else hand.

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LIST OF ABBREVIATIONS

CAN	- Acrylonitrile
HCl	- Hydrochloric Acid
BT	- Break through time
PPM	- Parts per million
PPT	-Parts per thousand
TSC	- Total Solid Content
FTIR	- Fourier-transform infrared
GC	- Gas chromatography
EDTA	- Ethylenediaminetetraacetic acid
EBT	- Eriochrome Black T