# *SUMMARY*

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It was reported that most of nonionic surfactants can be constructed by addition of hydrophilic part (ethylene oxide) to hydrophobic part specially fatty alkyl chain containing active hydrogen in this thesis, aiming preparation mode tailor structure containing hydrophilic moiety in middle of surfactant molecule from succinate and maleate. These nonionic surfactants have many industrial applications.

## Part 1

Nonionic surfactants were prepared by construction of hydrophilic part, which was completed by reaction of succinic anhydride with ethanol amine followed by reaction with 1,2-dichloroethane, then with triethylene glycol. Finally coupling with fatty alkyl halides to produce nonionic surfactants amide ether type ($I_{a-f}$). Also the reaction of succinic anhydride with glycine was followed by 1,2-dichloroethane and excess of diethylene glycol to be finally coupled with fatty alkyl chloride to give nonionic surfactants diester containing both amide ether and ester ether. The structures of the prepared nonionic compounds were comfirmed by spectroscopic tools. The surface active properties of the products ($I_{a-f}$) and ($II_{a-f}$) were evaluated, and studied including surface and interfacial tensions, cloud point, foaming, emulsifications and biodegradability. All the prepared compounds are good biodegrable surfactants, and show good surface properties.

# Part II

Nonionic surfactants were prepared by construction of hydrophilic part, to be completed by reaction of maleic anhydride with ethanol amine, followed by reaction with 1,2-dichloroethane, then coupled with ethoxylated fatty alcohols containing different moles of ethylene oxide to give ($III_{a-c}$) nonionic surfactants. The structures of the prepared compounds were confirmed by spectroscopic tools. The surface active properties were evaluated and studied; showing good biodegrade ability and good surface properties.

Also, anionic surfactants were prepared by sulphation of nonionic surfactants ($III_{a-c}$ to $VIII_{a-c}$) to produce anionic surfactants ($IX_{a-c}$ to $XIV_{a-c}$). The structures of anionic surfactants were confirmed by spectroscopic tools and the surface active properties were evaluated and studied. It was found that anionic surfactants show good surface and biodegrability properties higher than the prepared nonionic compounds.