SUMMARY

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In the present work, surfactants obtained from oxygen- containing derivatives were considered because of the remarkable properties and wide varity of uses of these compounds. This study has been presented as follows :

Chapter (I) : It includes the synthesis of some nonionic surfactants by reacting the synthesized alkyl (methyl, n - butyl, n-hexyl and n-octyl) esters of cis 9,10 epoxy octadecanoate (I_{a-d}) and or trans 2,3 - epoxy octadecanoate (II_{a-d}) with propyl polypropenoxy alcohol containing different propylene oxide ratios (n~5,10,15 and 20) to produce; 9 (2)-hydroxy 10(3)-(propyl polypropenoxy ether) alkyl octadecanoate **($Ia_{(5,10,15,20)}$ - $Id_{(5,10,15,20)}$)**, and **($IIa_{(5,10,15,20)}$ - $IId_{(5,10,15,20)}$)**, respectively as nonionic surfactants (cf. scheme 1,2 page 67,68). The structure of the synthesized surfactants was confirmed by examination of their infrared and nuclear magnetic resonance spectra.

The surface active properties and biodegradability of these compounds are illustrated in (13 Tables);spectroscopic analysis (15 Figures) and critical micille concentration CMC (8 Figures) , which revealed the following. The synthesized nonionic surfactants may be used as antifoaming agents; with respect to the emulsifying properties

of these nonionic surfactants, the emulsification properties were greatly enhanced by increasing the number of methylene group (CH_2) in alkyl chain of esters where, the 9-hydroxy 10-[propyl polypropenoxy ether] octyloctadecoanoate **Id_5** recorded the optimum emulsification properties.

Chapter (II): This deals with the synthesis and evaluation of some glucose and sucrose esters[III_{a-d}, V_{a-d} and IV_{a-d}, VI_{a-d}] from 9(2)-hydroxy 10(3)-(propyl polypropenoxy ether) methyl octadecanoate (**$Ia_{(5,10,15,20)}$** and **$IIa_{(5,10,15,20)}$**) respectively. The structure of these compounds was established by IR and ^{1}H-NMR spectra. Moreover, the surface properties, biodegradability and antimicrobial activity of these compounds were evaluated and illustrated in (6 Tables),spectroscopic analysis (8 Figures) and critical micelle concentration CMC (4 Figures). All the synthesized sugar esters are good biodegradable surfactants, which, manifested the importance of their application without pollution problems.

Chapter (III) : This is concerned with the synthesis of new surfactant bearing. 1,3- dioxalane ring, which can be utilized as a new acid decomposable type of cleavable surfactant that might be formulated in many cosmetic products, from 9,10 - dihydroxy octadecanoic acid VII and 3-[α–(propyl polypropenoxy ether)] 1,2 - octadecandiol [VIII a-d] with ethyl acetoacetate and / or acetyl acetone, followed by alkaline hydrolysis, afforded the anionic new soap

bearing 1,3 - dioxalane ring [VII_{a-b} , IX_{a-d}] and nonionic surfactants bearing 1,3 dioxalane ring X_{a-d} respectively.

The surface properties, biodegradability and antimicrobial activity of these compounds were evaluated which illustrated in (8 Tables) , spectroscopic analysis (9 Figures IR and ^1H- NMR) , critical micille concentration CMC (2 Figures) and resistance to hydrolysis (3 Figures). The obtained results show that, the products of the new surfactant bearing 1,3-dioxalane ring have a pronounced surface activity and good emulsifying properties; some of these compounds show high ca^{++} stability hence they might be utilized in hard water and all the synthesized surfactant show good biodegradiability properties which manifested the importance of their application avoiding pollution problems.

Chapter (IV) : This deals with surface and thermodynamic parameters for representative surfactants particularly,1,3-dioxalane derivatives IX_{a-d} and X_{a-d} at different temperatures (20, 35 and 50 °C.) This part was studied for rational interpretation of the effect of structure and temperature factors on the value of the critical micelle concentration. The determination of thermodynamic parameters of micellization and adsorption has played an important role in developing such an understanding about the behaviour of surfactants in their media.

The author comes to main conclusions, that all representative surfactants are spontaneously micellized. Moreover, the obtained data

releaved that the selected surfactants have tendency of adsoption more than micellization. These types of surfactants were suggested to be used as emulsifying agents.

In general, the surface active properties in this study were quite satisfactory and it is hoped that, they will find uses in some industrial applications.