# Preparation and evaluation of some gemini surfactant

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This research aimed to synthesis some Gemini ( diametric )surface active agents as a novel class of surface active agent that contain tow identical hyDROPhobic group linked by spacer group ( poly methylene group ) and use it in different industrial purpose . Also testing of these compound to measure the percentage of biodegradability during one week and also carry out the biological activity against bacteria and fungiNonionic Gemini surface active agentsReaction of ethylene oxide with long chain fatty acid( Lauric ,Myrisitic, Palmatic, and Stearic ) by different mole ( 5, 7 , 9) in the presence of KOH at 140 ºc to give the prouduct ( I-V )• Two molecule fatty acid ethoxylate reacted with one moles succunic anhydride as sapacer group to give the product (Iv-vIII) a-cThe prepared compounds are evaluated as surface active agent by measuring surface properties. The measurements reveal the following facts:1. The values of surface and interfacial tension increased with increasing the number of ethoxy group.2. Cloud points for all compounds are higher than 100c.3. All compounds show decreasing in wetting where good wetting times are recorded with a low ethylene oxide.4. Foaming height increases with increasing the number of ethoxy group.5. Emulsifying properties increase with decreasing number of ethoxy group.6. HLB for this compound ranging from (6.2:12.6 ) and show it graduated increase by increase the ethoxy group• The biodegradability of these compoundes is measured by surface tension methods and gives a resonable results.• The biological activity of all compounds are screaned against +ve gram and -ve gram bacterial and fungi, are equal to and some times greater than those of reference drugs used .Cationic Gemini surfaces active agents:Cationic gemini surfactants are prepared as the following;• Reaction of fatty alcohol ( octyl, decyl ,dodecyl, tetra decylalcohol) with thionyl chloride to give fatty halide compound (Ix-xII)• Reaction of alkylene diamine (ethylene diamine , butylenes diamine , hexylene diamine ,octylene diamine ) with formic acid and formaldehyde to give tetra methylene diamine compound (xIII-xvI)• Addition of compound long chain fatty halides (Ix-xII ) to tetra methylene diamine derivatives ( xIII-xvI ) to get on cationic Gemini surface active agent (xvII-xx)• the chemical structure of cationic Gemini surface active agent were confirmed by spectroscopic tools.• The surface properties are measured and revels the following facts;1- The value of surface and interfacial tension increase with increase the chain length of fatty halide and decrease the chain length of the spacer2- The kraft point of all compounds less than zero .3- The wetting time increases with increases of the chain

length of fatty halide and decrease the chain length of the spacer .4- Foaming height decreases with increase of the chain length of fatty halide and decrease the chain length of the spacer5- Emulsion stability increase with decrease the chain length of fatty halide and decrease of the chain length of the spacer.6-Critical micelle concentration (CMC) values show fall with increase the chain length of fatty halide and decrease the chain length of the spacer7 - HLB for this compound ranging from (6.8 : 15.35 )The biodegradability of these compounds is measured by Surface tension methods and gives a resonable results.• The biological activity of all compounds are screened against +ve gram and -ve gram bacterial and fungi are equal to and some times greater than those of reference drugs used.