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Synthesis, Characterization and Study of Biological Activities to the Anionic Surfactants

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Abstract

Sodium salt of a-sulphonated fatty acid hydrazide was used as starting material to synthesis some important heterocycles as oxadiazoles to produce novel groups of anionic surfactants having a double function, antimicrobial and surface active agents. The structures of these compounds were performed by FTIR and CHN-analysis. The physical properties as (Density, pH, Concentration, Color, Viscosity and Stability to hydrolysis) were determined. The surface active agents were used in (O/W) emulsions depend on value of (HLB) [Hydrophilic-Lipophilic Balance].

Introduction

Amoning anionic surfactants containing an aromatic structure element, the most common group, are alkyl benzene sulphonates accompanied by alkyl-naphthalene sulphonates. In these compounds, hydrophilic sulphonic group is separated from long chain alkyl hydrophobic by single six member benzene or naphthalene rings. As an example, the derivatives of alkyl thiophene or alkyl pyrrole having a sulphonic or carboxylic hydrophilic group can be mentioned. Long chain (C_8 – C_{18}) 3-n-alkyl thiophene, 1-and 3-n-alkyl and 3-n-alkanoyl derivatives of pyrrole were obtained as hydrophobic intermediates for synthesis of anionic surfactants containing sulphonic or carboxylic group. In the literature, mainly in patent description, the examples of synthesis of surface active alkyl benzopyrrole and alkyl benzimidazole sulphonates have been reported [1].

The reaction of butyrol acetone with primary amines at high temperatures produces N-alkyl substituted pyrrolidones. However, other methods of incorporating the pyrolidone nucleus also have been investigated. Butyrolactone reacts with diamines, when the diamine is in excess, to afford N-amino alkyl pyrrolidones, which can be further condensed with fatty acid , anhydrides, acid chlorides, or esters to produce amido alkyl pyrrolidones,. When the fatty acids are in the surfactant range (C_8 – C_{16}), highly surface active compounds are formed [2].

A family of novel mono alkyl glycerol ether surfactants with different hydrophobic lengths (C_9 – C_{16}) and tryptophane were synthesized on a laboratory scale and their aqueous surface active properties are studied [3, 4].

More recently new bis-quaternary pyridinium surfactants were synthesized and characterized. The surface tension in aqueous media, cmc value, and area per molecule were determined and compared with corresponding mono quaternary-pyridinium bromides which were synthesized and studied [5-7]. It has been well established that various trizoles, oxazoles, benzoxazoles are biological interest [8-11]. This encouraged me to synthesize novel groups of anionic surfactants containg pyridazine, oxadizole, phthalazinone and thiazole derivatives from sodium salt of a