

## Synthesis of morpholinium salts based on chloroacylated derivatives of dihydroquercetin

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### Abstract

The flavonoid dihydroquercetin and its esterified derivatives possess various biological activities and are widely used as dietary supplements and in pharmacology. A significant disadvantage of this flavonoid is its low solubility in water at ordinary temperatures of up to 0.03%, which negatively affects its biological activity. Nature overcomes this problem by glycosylation, sulfation, and phosphorylation. In chemistry and pharmacology to overcome this problem, there are several synthetic approaches. For dihydroquercetin (DHQ) is the inclusion of DHQ in the cyclodextrin matrix or the formation of a complex of DHQ with basic natural amino acids. In this paper, a method is proposed for obtaining water-soluble morpholinium salts based on chloroacylated derivatives of DHQ. The acylation reaction was carried out in dioxane, pyridine was used as an acceptor of choric hydrogen. The target compounds were obtained with a yield of 68-79%. As a result, chlorinated derivatives based on DHQ and its acyl and benzyl derivatives were synthesized. These derivatives in the interaction with morpholine form its salts, which, as it turned out, have a high water solubility. Pentamorpholine salt of DHQ had the highest solubility in water, up to 6.5% at room temperature, which is 200 times more soluble than the original DHQ. The proposed synthetic approach to increase the water solubility of acyl derivatives of DHQ can be extended using other nitrogenous bases and other haloacyl derivatives of DHQ.

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