Conductivity Properties of Selected Aliphatic Monocarboxylic Acid Anions in Water at 298.15 K

Zdzisław Kinart^{1,*} and Renato Tomaš^{2,*}

¹ Department of Physical Chemistry, Faculty of Chemistry, University of Lodz, 90-236 Lodz, Pomorska 163/165, Poland

² Department of Physical Chemistry, Faculty of Chemistry and Technology, University of Split, Ruđera Boškovića 35, HR-21000 Split, Croatia

*E-mail: zdzislaw.kinart@chemia.uni.lodz.pl, rtomas@ktf-split.hr

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The article presents the electric conductivity values of sodium salts of four selected monocarboxylic acid derivatives in aqueous solution: those with a chlorine substituent in the peripheral position, *i.e.* $\text{ClCH}(\text{CH}_2)_n\text{COOH}$; those with a bromine substituent in the peripheral position, *i.e.* $\text{BrCH}(\text{CH}_2)_n\text{COOH}$; as well as unsaturated sodium salts with a double bond in the peripheral position, *i.e.* $\text{CH}_2=\text{CH}(\text{CH}_2)_n\text{COOH}$; and unsaturated sodium salts with a double bond in the second position, *i.e.* $\text{CH}_3-\text{CH}=\text{CH}(\text{CH}_2)_n\text{COOH}$. All conductivity measurements were performed at 298.15 K in the concentration range of $0.0005 < c / \text{mol} \cdot \text{dm}^{-3} < 0.018$. The obtained values allowed the limiting molar conductivities (Λ_m^0) of the studied electrolytes to be determined using the Fuoss-Justice equation. Based on these (Λ_m^0) values, the molar limiting conductivity values (λ_A^0) for individual anions of the tested electrolytes were calculated and analyzed as a function of carbon chain length. The work also examines the effect of substituent type (Cl or Br) and double bond location on the limiting molar conductivity values of the tested monocarboxylic acid anions and compares them with literature values.

Keywords: Molar conductivity, sodium salts of unsaturated carboxylic acids, sodium salts of monocarboxylic acids with Cl and Br substituents.

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