

Title	Effect of temperature on the surface properties of aqueous solution of arachidonic acid
Sub Title	
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Publisher	共立薬科大学
Publication year	1993
Jtitle	共立薬科大学研究年報 (The annual report of the Kyoritsu College of Pharmacy). No.38 (1993.) ,p.83- 83
JaLC DOI	
Abstract	
Notes	抄録
Genre	Technical Report
URL	https://koara.lib.keio.ac.jp/xoonips/modules/xoonips/detail.php?koara_id=AN00062898-00000038-0083

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Effect of Temperature on the Surface Properties of Aqueous Solution of Arachidonic Acid

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The surface tension of aqueous solution of arachidonic acid (AA) was measured with a Du Nöuy tensiometer at pH 7.80 and various temperatures, and the effect of temperature on the surface properties of AA was investigated. The value of critical micelle concentration (cmc) of AA increased and the surface tension at the cmc, γ_{cmc} , decreased as the temperature was raised from 30 to 60°C. The Langmuir constant k concerning the strength of adsorption decreased, the saturated adsorption amount of AA, Γ_{∞} , at the air–water interface decreased, and the area occupied by an AA molecule at the saturated adsorption, A_{∞} , increased as the temperature was raised. The standard free energy for the adsorption, ΔG_{ad} , was of negative value, and the absolute value $|\Delta G_{\text{ad}}|$ became larger as the temperature was raised because of the negative value of the standard enthalpy change ΔH_{ad} and the positive value of the standard entropy change ΔS_{ad} . The standard free energy of micellization, ΔG_{m} , was of negative value, and it was similarly found that $|\Delta G_{\text{m}}|$ became larger as the temperature was raised because of the negative value of the standard enthalpy change ΔH_{m} and the positive value of the standard entropy change ΔS_{m} .

* 本報告は *Chem. Pharm. Bull.*, 41, 6–11 (1993) に発表。

** ファイザー製薬

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