

Title	Thermodynamic study on the release of thiamine disulfide (TDS) from TDS-higher fatty acids complexes. I. effect of even-numbered fatty acids
Sub Title	
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Publisher	共立薬科大学
Publication year	1990
Jtitle	共立薬科大学研究年報 (The annual report of the Kyoritsu College of Pharmacy). No.35 (1990.) ,p.71- 71
JaLC DOI	
Abstract	
Notes	抄録
Genre	Technical Report
URL	https://koara.lib.keio.ac.jp/xoonips/modules/xoonips/detail.php?koara_id=AN00062898-00000035-0071

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**Thermodynamic Study on the Release of Thiamine Disulfide
(TDS) from TDS-Higher Fatty Acids Complexes. I.
Effect of Even-Numbered Fatty Acids***

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The rates of release of thiamine disulfide (TDS) from even-numbered fatty acid-TDS complexes were determined in a JP XI dissolution test apparatus in JP XI disintegration test medium No. 1 (pH 1.2) at various temperatures, and the thermodynamic quantities for the release of TDS from the complexes were estimated. The concentration of TDS was determined spectrophotometrically.

The rate of release of TDS from the complexes decreased with increasing carbon number (n) in the fatty acid and increased at higher temperature. The values of activation Gibbs energy ΔG^\ddagger and activation enthalpy ΔH^\ddagger for the release of TDS from the complexes were positive, and the values increased with increasing n . The value of activation entropy ΔS^\ddagger was negative, and the value of $|\Delta S^\ddagger|$ decreased with increasing n . The release of TDS from the complex was found to be an enthalpically controlled reaction. The release of TDS from octadecanoic acid-TDS complex, (SA)₆(TDS), was found to be most disadvantageous from the enthalpic viewpoint and most advantageous from the entropic viewpoint as compared with the complexes formed with hexadecanoic acid and tetradecanoic acid. Furthermore, the largest value of activation energy for the release of TDS from (SA)₆(TDS) was found to correspond to the largest positive value of ΔG^\ddagger for the release of TDS.

* 本報告は *Chem. Pharm. Bull.*, 37 (10), 2582—2586 (1989) に発表.

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