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Formation of a Thiamine Disulfide Complex with Fatty Acid Mechanism of Formation of the Complex

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The formation of complexes between thiamine disulfide (TDS) or O-acetyl thiamine disulfide (O-acetyl TDS) and fatty acid or fatty acid methyl ester in methanol has been studied by fluorescence quenching and ^{13}C -NMR relaxation (T_1) measurements. The association constants (K values) of TDS and O-acetyl TDS with fatty acids (from 11 : 0 to 18 : 0, and 18 : 1, 18 : 2, 18 : 3, 20 : 4) and fatty acid methyl esters have been determined. These values do not depend on either the number of carbon atoms or the degree of unsaturation of the fatty acid. The K values of TDS and O-acetyl TDS with fatty acid were 7.8 M^{-1} and 5.1 M^{-1} , respectively. The K values of TDS and O-acetyl TDS with fatty acid methyl ester were very small. These results show that the -OH moiety in TDS and the -COOH moiety in the fatty acid are necessary for formation of the complex.

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