Quantitative NMR analysis of cyclic fatty acid using pseudo-standard material

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Detection and separation of specific product is important in reaction engineering. Generally, reaction products are analyzed by HPLC and LC technology for the detection and quantification. However, for this quantitative analysis, the standard sample for the desired product is necessary. To prepare the standard sample, complicated separation processes are necessary. Typically, NMR is used to verify chemical structure. In this work, 1H-NMR is used for the quantitative analysis of specific cyclic compound in a mixture using the pseudo-standard material. Here, pseudo-standard sample is the substance with similar structure to the desired product. The mesitylene is adopted as a pseudo-standard sample to quantify the cyclic dimer of fatty acid. The NMR results show the intensity of a resonance is proportional to the mesitylene concentration. With this linearity, the concentration of cyclic dimer of fatty acid was obtained. For the validation of this method, several linear and cyclic C7 compounds were analyzed by 1H-NMR.