

NMR을 이용한 음이온세제의 혼합물로부터
LAS의 분리 및 순도결정

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Separation of LAS from Mixture of Anionic Detergents
and Purity Determination of LAS by NMR

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The main raw materials for synthetic detergent are linear alkylbenzene sulfonate(LAS), branched alkylbenzen sulfonate(ABS), alcohol

ether sulfate (AES) and alcohol sulfate(AS).

Commonly, mixtures of LAS, ABS, AS, and AES are used in synthetic detergents. A

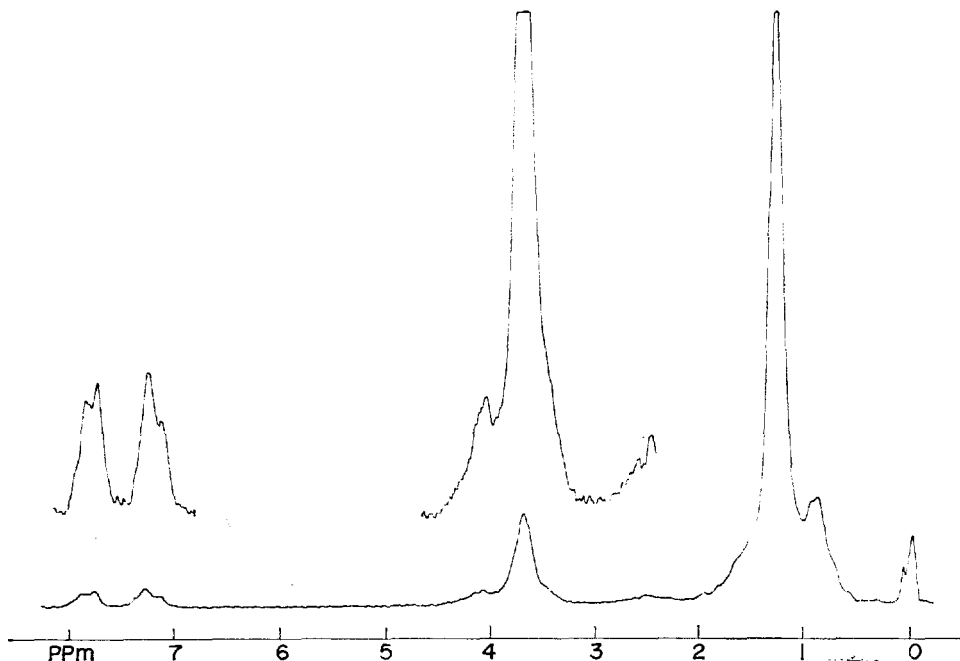


Fig. 1. NMR spectrum of mixture (LAS, AS, AES) in $CDCl_3$.

study on mixture of anion detergent was reported by Sones *et al.*, using gas chromatography^{1,2}.

In this paper, the purity of linear alkylbenzene sulfonate separated from mixture, by acid hydrolysis, reformation of soap, and combination with methylene blue, is checked by NMR spectrometer. In LAS, the total proton of methylene group/that of methyl group ratio is 21/6, and the total proton of alkyl group/that of benzene group ratio is 27/4, LAS molecule

having eleven methylene groups, two methyl groups, and one benzene nucleus. The NMR spectrum for mixture of anion detergent is represented in Fig. 1, and that for LAS, extracted from anion detergent mixture, in Fig. 2. In Fig. 1, there is one peak between 3 and 4ppm, while there is no peak between 3 and 4ppm in Fig. 2.

From the results obtained above, we are able to assume that only alkylbenzene sulfonate type of anion detergent is separated. Experimental

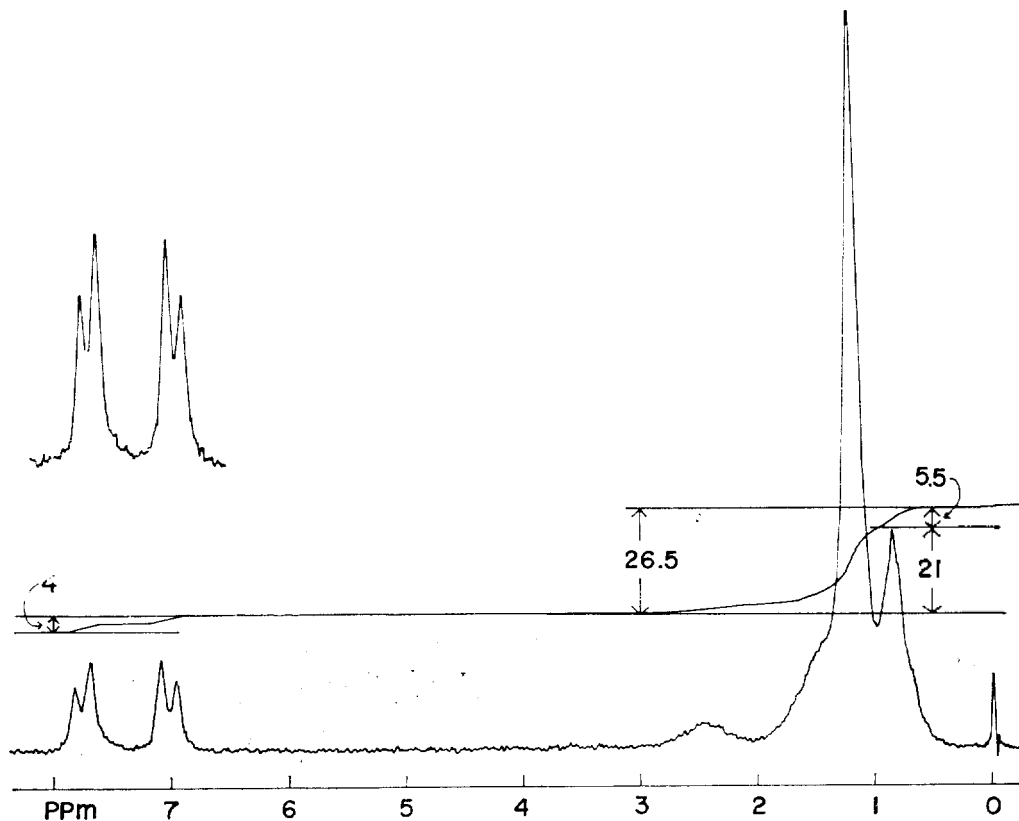


Fig. 2. NMR spectrum of LAS extracted from mixture.

Table 1. Theoretical value and experimental value of total proton of methylene group/total proton of methyl group and total proton of alkyl group/total proton of benzene group of LAS extracted from mixture.

LAS	Methylene group/Methyl group		Alkyl group/Benzene group	
	Theoretical value	Experimental value	Theoretical value	Experimental value
	21/6	21/5.5	27/4	26.5/4

value, determined by the NMR spectrum, and theoretical value are shown in *Table 1*, and they agree well.

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