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Appendix

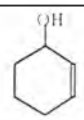
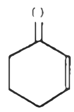
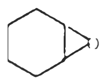
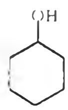
Correction Factor from Vaporization of Products in the Filtration Step.

The purpose of this experiment is to correct the loss from the vaporization of products in the vacuum filtration step. In the filtration step, products may vaporize by suction filtration. The catalyst was washed with ethyl ether to remove as much as product from pores of zeolite. Due to lack of standards of 2-cyclohexen-1-ol and 2-cyclohexen-1-one, cyclohexanol and cyclohexanone were applied instead. For the correction, 30 mmol of cyclohexene, 0.5 mmol of cyclohexene oxide, 0.08 mmol cyclohexanol, and 1.0 mmol of cyclohexanone, were mixed in the reaction flask. The chromatogram of the standard mixture is shown in Figure 1. The calculation for the correction factor is described as follows:

Peak area of internal standard	= 10284 abu.	=	0.160 mmol
Peak area of cyclohexene oxide	= 18980 abu.	=	0.16 x 8980 / 1028 mmol
		=	0.295 mmol

The known amount of cyclohexene oxide is 0.500 mmol but the calculation from GC analysis is 0.295 mmol, therefore the correction factor of cyclohexene oxide for this method is 0.500/0.295 = 1.7. Similarly, the correction factor for cyclohexanol and cyclohexanone are also 1.7. This shows that there is no difference in correction factor among these three compounds. We then assume that 2-cyclohexen-1-ol and 2 cyclohexen-1-one behave in similar way. In addition, the effective carbon numbers[61] for GC responses which are affected by different functional groups on cyclohexene ring are not significantly different as shown below:

Table 1. Effective carbon number and correction factor of some organic compounds

Compounds	Effective carbon number	Correction factor (C_{std}/C_{sample})*
	5.15	1.02
	4.90	1.07
	5.0	1.05
 internal standard	5.25	1.00

* C_{std} = effective carbon number of internal standard

C_{sample} = effective carbon number of each oxidation product

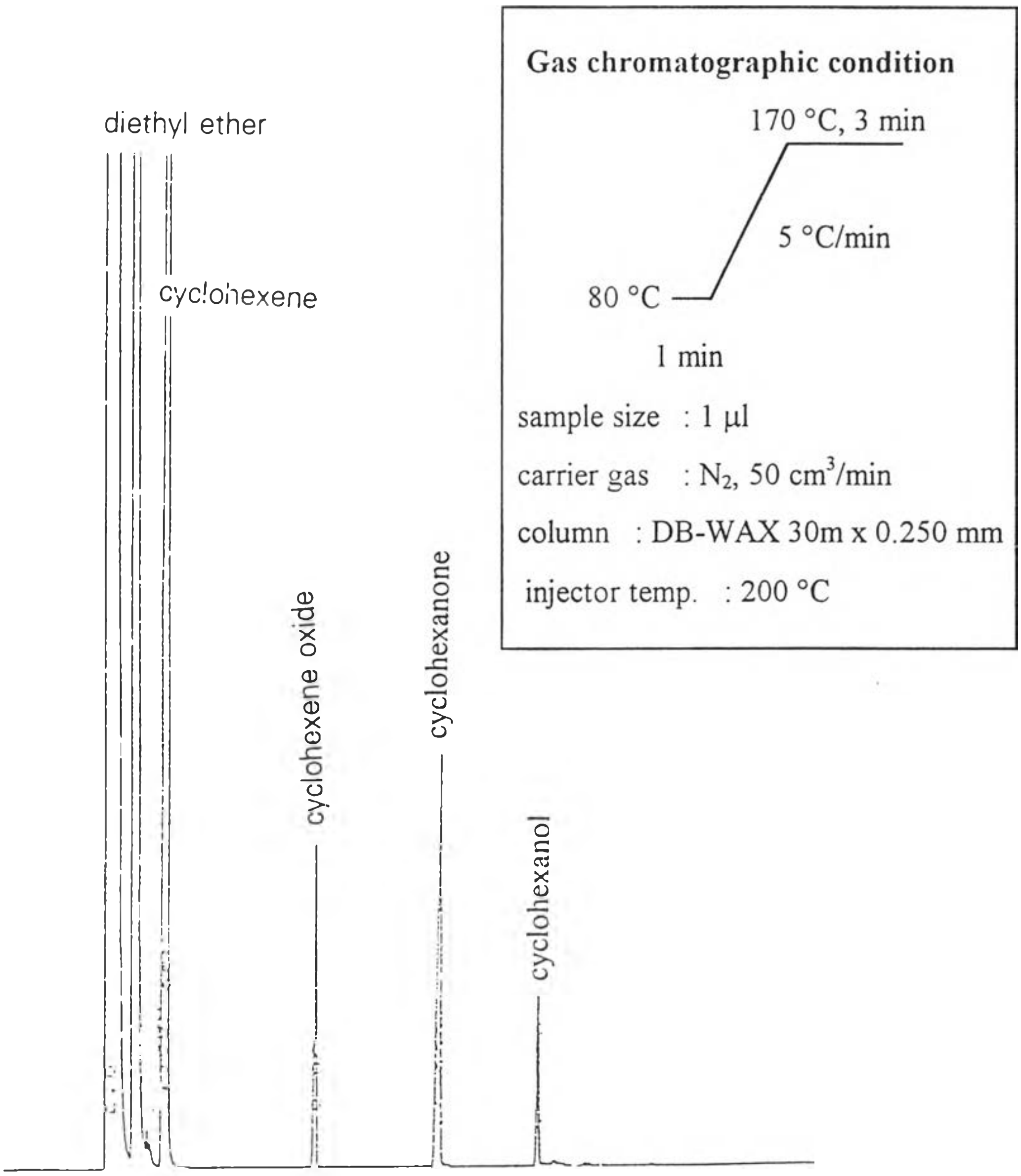


Figure 1. Gas chromatogram of standard mixture for determination of correction factor

Vitae

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