Thesis Title	Modification of Gas Chromatograph Inlet System
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Abstract

Gas chromatography (GC) is the science of separation. Results are normally shown as chromatograms. Many informations can be derived from the chromatograms, for examples, retention factor (k), plate numbers (N), height equivalent to a theoretical plate (H). The last two parameters directly relate to the effectiveness of the column as well as of the GC installation.

This study is focus on the improvement of the Finigan Split/splitless injector, especially the split system. The injector has been poorly designed and it can only splits the carrier gas but does not split the sample. Accordingly, samples are usually overloaded and separation is less effective. This fraud is corrected by installation of a new split valve (OSS-2) and the pneumatic flow is redirected. This modification can increase the N more than 6 times. Also, the split out is directed to the detector and use as make up gas. This will help save a huge volume of the make up gas. However, during injection the split out sample is also directed to the detector. This provides a very benefit in the analysis. As soon as the sample is injected, an immediate detector response is observed and it will serve as the injection point of which many other parameters (hold-up time, adjusted retention time) can be accurately obtained. Careful measurement of the split area and areas of peaks eluted out of the column, it is found that the ratio of these areas can be used as a representative of the split ratio of the split valve. Thus, it is the first report of the direct measurement of the split ratio on the gas chromatogram.