

# Gas chromatography

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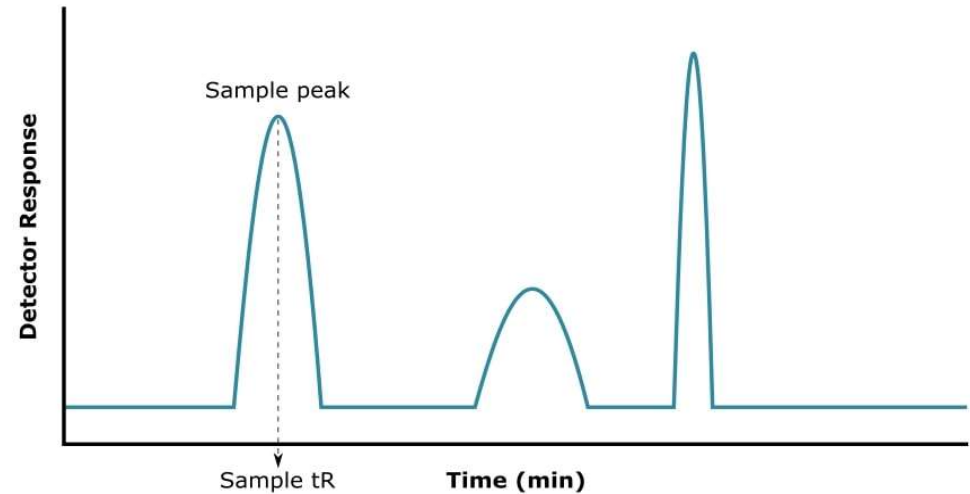
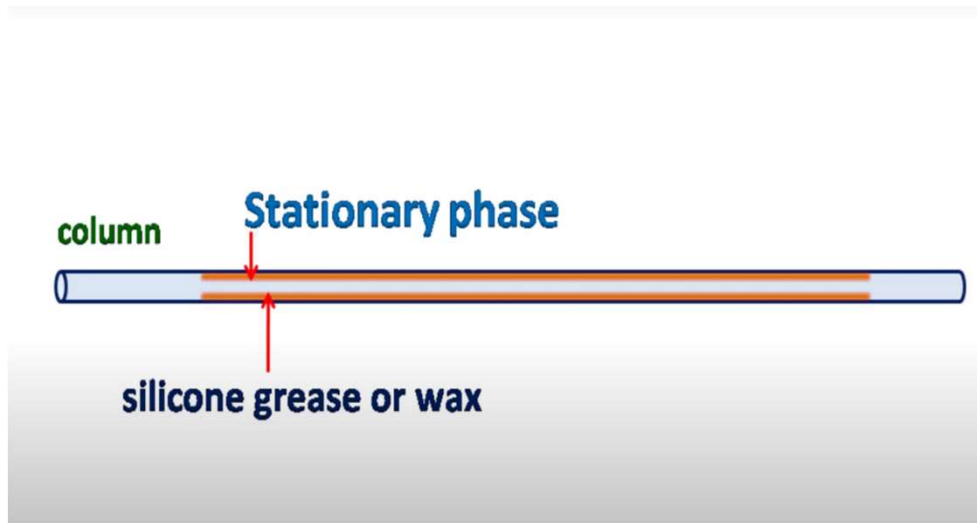
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# What is the Gas Chromatography?

We have to know what we extract.

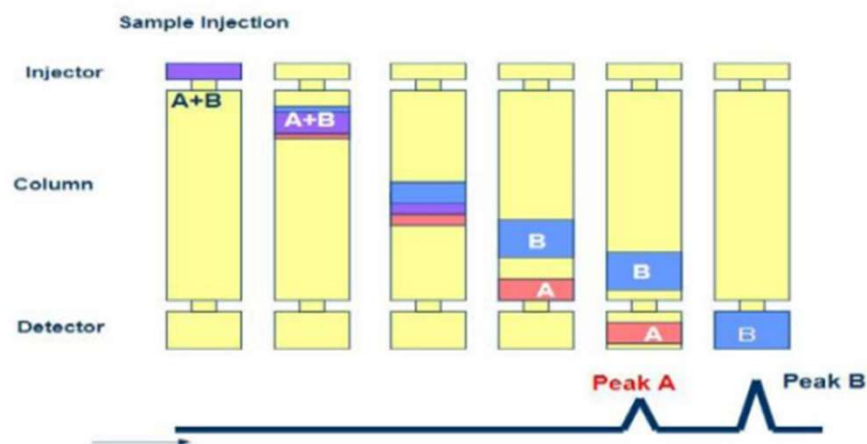
The gases or liquids goes through the tube and adsorbes the inside surface of the column (tube)



# GC structure

We get graphs.

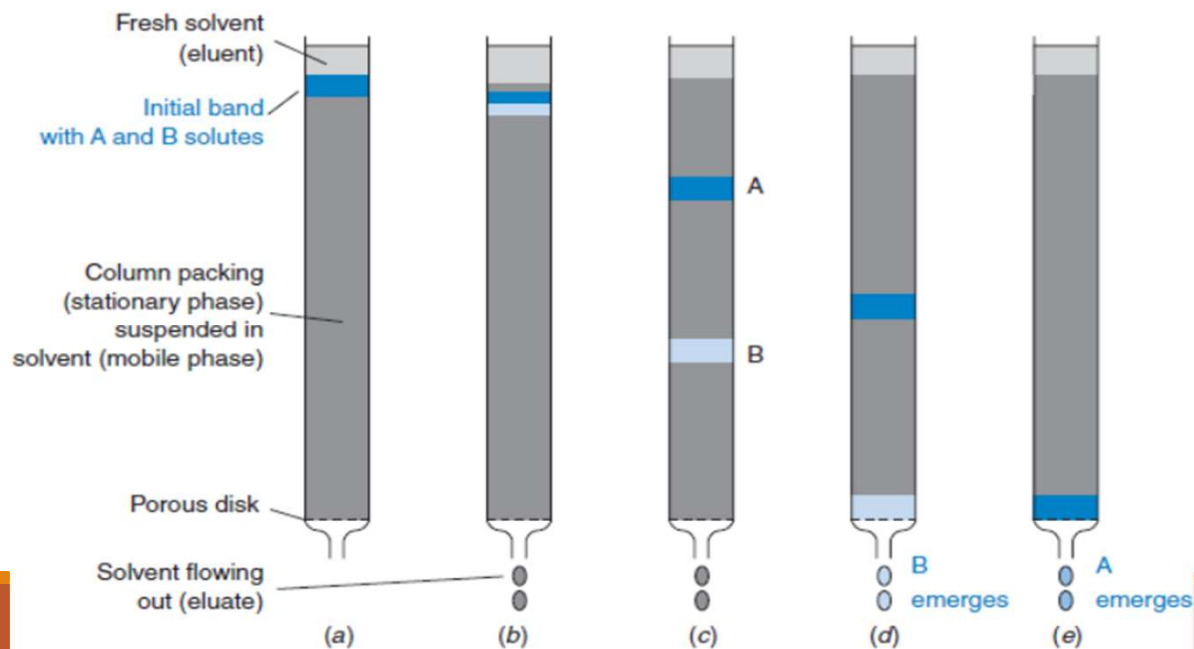
Density of the substances  
gives detector the pulse.



# Gas chromatography

Gas chromatography (GC) is an analytical technique used to separate and detect the chemical components of a sample mixture to determine their presence or absence and quantities

Same as extraction, one phase is hold in place while others moves through.

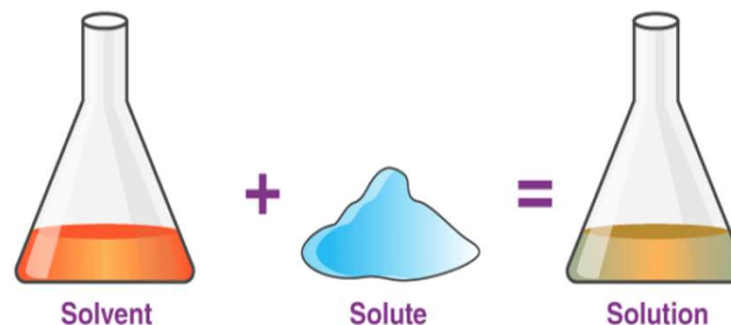


# How does GC work

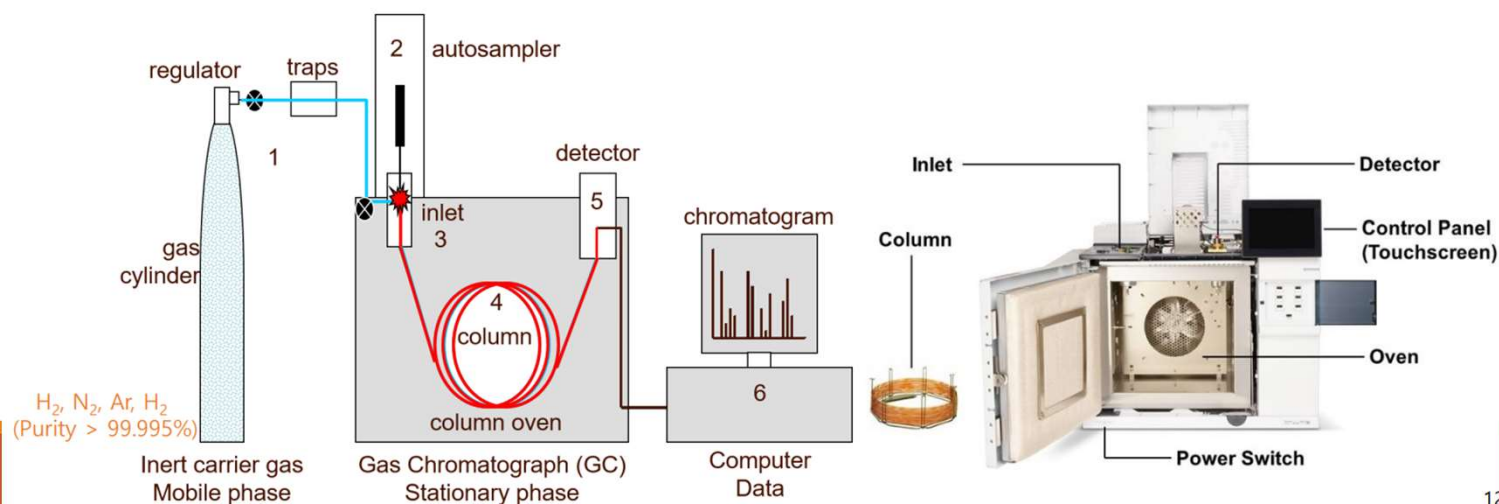
Detector response the elution time.

GC reacts the gases or liquids absorption time and its response.

There is a carrier gases as well.

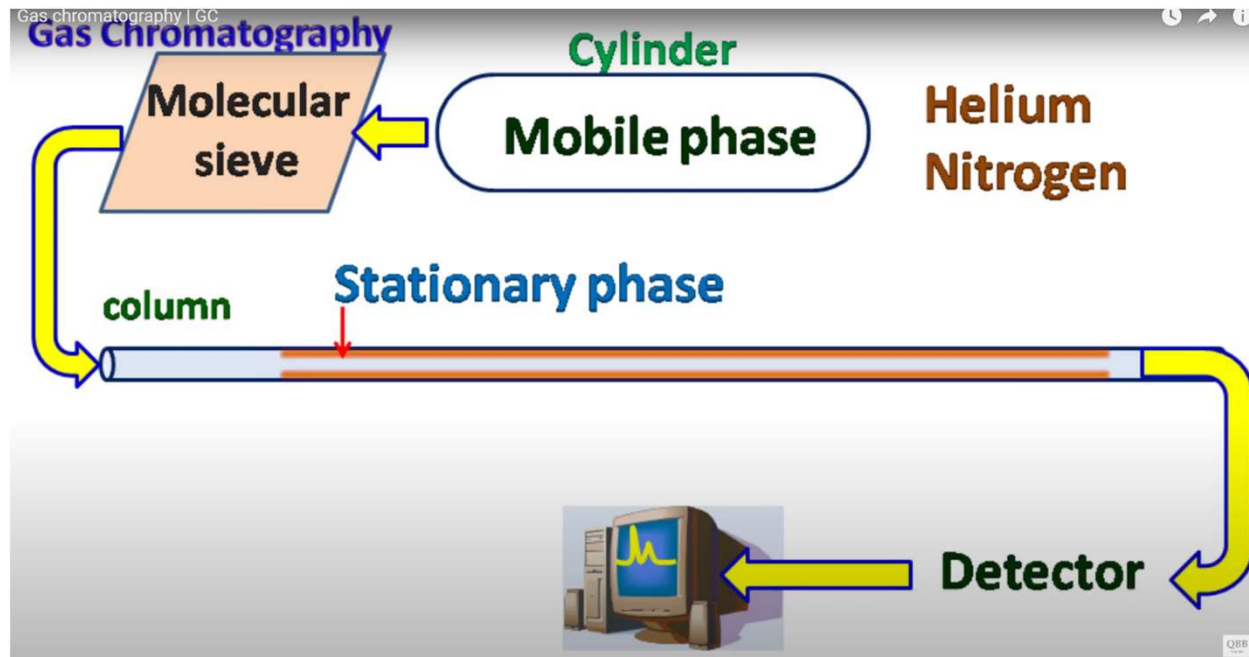


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# The system

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# The role in the research

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It is widely used in most industries

It checks quality control of products of car products, chemicals, petrochemicals. Our goal is to find alternative fuel for cars that cheaper and efficient at the same time.

Safety and monitoring from environmental samples, microplastics and food and wine, to forensics.



# My research process (GC results)

## Effect of zeolite structure and addition of steam on n-dodecane catalytic cracking over BEA zeolites with various Si/Al<sub>2</sub> ratio

### ❖KTO (SCC and DCC) Conversion

DCC rxn, feed (DD), temp. = 550 °C, catalyst loading = 0.675 g,  
LHSV = 16/h, Do=14.4 (ccm), TOS = 1 to 6h

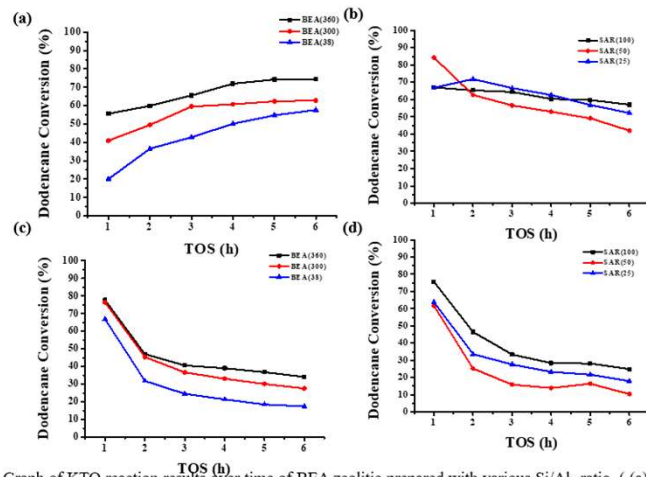


Fig. 1. Graph of KTO reaction results over time of BEA zeolite prepared with various Si/Al<sub>2</sub> ratio. (a) commercial BEA zeolite SCC conversion, (b) manufactured BEA zeolite SCC conversion, (c) commercial BEA zeolite DCC conversion, (d) manufactured BEA zeolite DCC conversion)

### ❖KTO (SCC and DCC) E+P+B Selectivity

DCC rxn, feed (DD), temp. = 550 °C, catalyst loading = 0.675 g,  
LHSV = 16/h, Do=14.4 (ccm), TOS = 1 to 6h

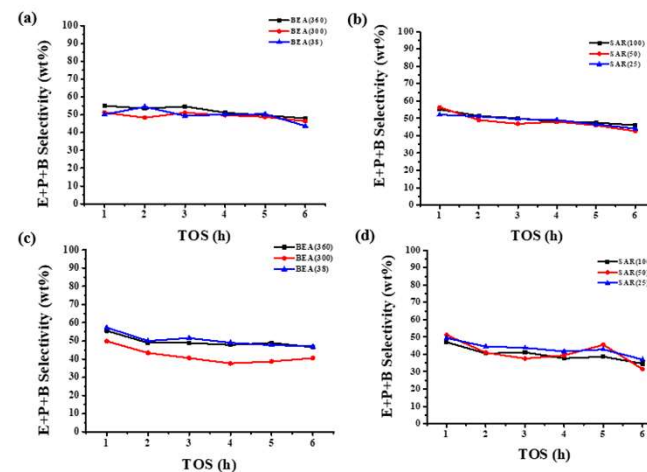


Fig. 3. Graph of KTO reaction results over time of BEA zeolite prepared with various Si/Al<sub>2</sub> ratio. (a) commercial BEA zeolite SCC E+P+B yield, (b) manufactured BEA zeolite SCC E+P+B yield, (c) commercial BEA zeolite DCC E+P+B yield, (d) manufactured BEA zeolite DCC E+P+B yield)

# Ongoing studies

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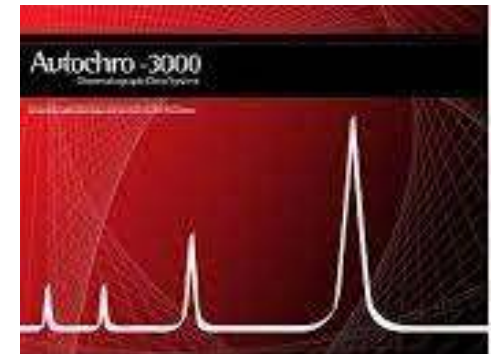
The research is KTO. We are trying zeolites one by one to know their selectivity( selectivity-powder only accelerates the release of certain substances).

# Software

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Autochro-3000 is the software that is 32 bit and fully compatible with MS Windows XP. It provides independent module to manage data (Analysis) and control instruments (System) for optimized analysis condition.

It is great software for Korea right now and its software is not open.



## Personal suggestion.

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Autochro-3000 should work on software design. It should be easy to use. Atochro-3000 and Origin Pro do almost the same work. The user always open two windows and have to copy and paste the same data from Atochro-3000 to Origin Pro. It is also time consuming.

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Thank you for listening

