



Republic of Iraq
Ministry of Higher Education
and Scientific Research
Al-Mustaqbal University College
Chemical Engineering and Petroleum Industries
Department

Subject: Oil and Gas Field Processing
3rd Class

Lecture 9

Reforming

Reforming means rearrangement of molecules without much affecting the average molecular weight of feed which is generally naphtha of gasoline boiling rang.

Reforming is carried out to produce high quality (octane number) gasoline by heating with or without catalyst the naphtha.

Feed for Reforming:

The feed is generally naphtha produced during straight run distillation of crude oil, catalytic cracking and cooking process. The best result is obtained with naphtha (produced during straight run distillation) having high naphtha content.

Reforming Product:

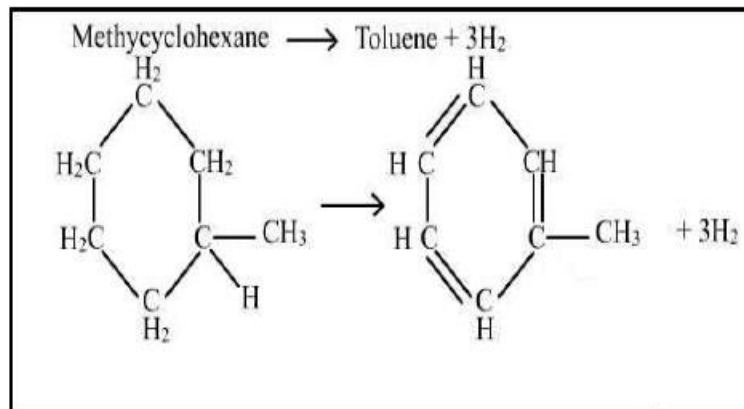
Besides the main product (reformate) or reformat gasoline, reforming also produces lighter hydrocarbons (gases), hydrogen and traces of very high boiling materials.

Chemical Reaction in Catalytic Reforming:

Octane number increases in the order:

paraffine → olefin → naphthene → iso- paraffin → aromatic

The main reaction in the reforming process is dehydrogenation of naphthene to produce aromatics



Types of Reforming:

Reforming can be thermal or catalytic as in the case of cracking. Catalyst apart from accelerating the process also enhances the yield and quality (octane number) of gasoline. The gasoline produced by reforming is called reformed gasoline or reformat. Thermal reforming has been almost completely replaced by catalytic reforming.

- Thermal Reforming

This is carried out in absence of catalyst and its similar to high temperature, low pressure thermal cracking. Feed is usually Naphtha and the products are mainly gas (13 -14%) and gasoline (75 -80%) of octane number 81 -86, rest being polymer (unwanted gum) and losses.

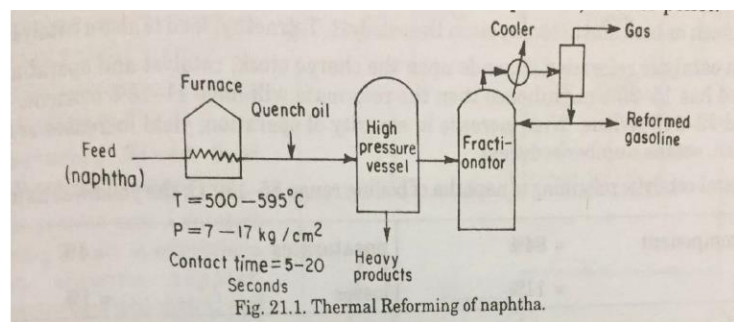


Figure: Thermal Reforming of Naphtha

- Catalytic Reforming

Reforming in the presence of a catalyst is called catalytic reforming.

There are two types of catalyst are used:

- Non- precious metal oxide type (e.g. molybdena or chromia supported on alumina base).
- Precious metal oxide type (e.g. platinum on a silica-alumina or alumina base).

Platinum is more active and selective catalyst.