I. INTRODUCTION

Crude oils are mixtures of many substances, often difficult to separate, from which various oil products (such as petroleum gases, gasoline, kerosene, gas oil, fuel oil, lubricating oil, wax and bitumen) have to be manufactured.

These substances are mainly compounds of only two elements, carbon (C), and hydrogen (H), and are therefore called hydrocarbons. Other elements may be ignored at this stage since they are present in only small quantities, although some of them, such as sulphur (S), have an important effect on product quality.

Chemical products manufactured from petroleum cover a much more varied rang of molecular types than merely hydrocarbons. They do not occur as such in crude oil or natural gas, but they are all compounds of carbon and hydrogen, most but not all of which are combined with other elements, such as oxygen (O), nitrogen (N), sulfur (S) or chlorine (Cl).[1]

I.I Crude Oil Classification

I.1.1 Paraffinic Crude Oils

These contain paraffin wax (higher molecular weight paraffins which are solid at room temperature), but little or no asphaltic (bituminous) matter. They consist mainly of paraffinic hydrocarbons and usually give good yields of paraffin wax and high-grade lubricating oils.

I.1.2 Asphaltic Crude Oils

These contain little or no paraffin wax, but asphaltic matter is usually present in large properties. They consist mainly of naphthenes and yield lubricating oils whose viscosities are more sensitive to temperature than those from paraffin crude, but which can be made equivalent to the latter by special refining methods. This crude are now often referred to as naphthenes crude oils. [2]

I.1.3 Mixed Crude Oils

These contain substantial properties of both paraffin wax and asphaltic matter. Both paraffins and naphthenes are present, together with a certain properties of aromatic hydrocarbons.

This classification is a rough and ready division into types and should not be used too strictly. Most crude exhibit considerable overlapping of the types described and by far the majority is of the mixed base type.

The nature of the crude governs to a certain extent the nature of the products that can be manufactured from it and their suitability for special applications. Naphthenes crude will be more suitable for the production of asphaltic bitumen, paraffinic crude for wax. Naphthenes crude and even more so an aromatic one will yield lubricating oils whose viscosities are rather sensitive to temperature. However, modern refining methods permit greater flexibility in their use of crude to produce any desired type of product. [3]

Crude are usually classified into three groups, according to the nature of the hydrocarbons they contain.

I.2 Crude Oil Refining

A modern petroleum refinery is a complex of many highly interrelated processes, the objective of which is to derive from a crude oil of given type and cost higher value products meeting required quality and demand.[4]

Separation is a physical division of crude oil or products into various fractions. The most common technique used throughout a refinery is distillation. Conversion involves chemically changing the size of molecular structure to yield more desirable properties.

Without necessarily changing the boiling range. Treating removes contaminants or reduces them to innocuous forms. Blending involves mixing various refinery streams to make finished products of the required quality. (Figure 1) shows the flow of crude oil and intermediate product streams for a typical refinery. Overall flow various is from the crude distillation unit at the left, through various process units, to the product blending streams on the right. [5, 6]

Fig.(1): SIMPLIFIED REFINING FLOW SCHEME