SUMMARY

A general survey of the literature dealing with the study of the general properties of the petroleum crude oil and its constituents, especially the heavy fractions and their compositions. The survey also includes the different methods that deals with upgrading of the petroleum heavy residues in order to get useful products.

The experimental part deals with the study of the chemical compositions of two petroleum heavy residues, one delivered from Alexandria Petroleum Refining Company, the other was delivered from Suez Company for Petroleum Industry.

The two heavy residues were subjected to solvent extraction using n-pentane, n-heptane and ethyl acetate. The process of solvent extraction aims to separate Maltenes, asphaltenes.

The Maltenes were further subjected to liquid chromatography (column Chromatograph) in order to separate them to saturates and aromatic (Mon-, Di- and Poly-) and resin.

The UV-Vis spectroscopic technique was applied to the aromatic fraction to know how much mono-, di-, and poly aromatics are present in the aromatic fraction.

Infrared spectroscopic technique was applied to study the two vacuum residues, the Maltenes, asphaltenes and aromatics.

The saturates which were separated from the Maltenes of the two vacuum residues with different solvents are studied by gas chromatography in order to know how much they contain n-paraffins and cyclo-paraffins.