# Summary

The present work involves an analytical study relates to spectrophotometric and atomic absorption spectrometry methods of analysis for direct determination of chromium in rock and mineral solutions and some environmental samples..

It includes three main parts; **the first chapter** comprises some information about chromium, its occurrence, physical and chemical properties, uses, health and environmental effects and analytical techniques for chromium determination. It mainly includes atomic absorption spectroscopy technique and spectrophotometric technique.

A literature survey composed of basis of atomic absorption technique, type of interferences, methods of overcome of interferences and spectrophotometric chromium survey.

**The second chapter** includes the specification of chemicals, solutions prepared reagents and instruments applied in the present work. Recalibration of the conditions outlined for atomic absorption method. Beside the recommended method that should be used for sample preparation.

**The third chapter** summarizes the obtained result and discussion of the work done in this thesis and divided into two parts:

**The first part** considers the determination of chromium by atomic absorption spectrometry, it includes three main items:

a) Optimization of the instrumental parameters including flame composition and fuel flow to obtain the best sensitivity and precision for Cr.

b) Interference studies that arises from the associated metal ions and anions in matrice solution.

c) The application of the method for Cr determination in minerals and rocks.

Ammonium chloride is used as amasking agent for the determination of chromium.

**The second part** relates to the determination of chromium (VI) by spectrophotometric technique. This part contains the results and discussion for spectrophotometric procedures for the determination of chromium (VI) using thymol blue and dimethyl yellow reagents. These methods based on the reaction between chromium and the developed color is determined by UV- spectrophotometer to form complexes against a blank prepared by the same way except addition of metal.

The following experimental variables absorption spectra, effect of pH, effect of volume of buffer , effect of reagent concentration, effect of sequence of addition, effect of time, effect of temperature, influence of foreign ions, molar ratio of complexes, validity of the method were

investigated. Beer's law is obeyed with in the concentration ranges (1-10, 1-15 μg/ml) for chromium in case of TB and DMY reagents, respectively. Molar absorptivity, Sandell sensitivity, detection and quantification limits are calculated. This part contains also the application of the methods for chromium determination on water samples.