CHAPTER I

INTRODUCTION

The application of atomic spectra to chemical analysis has proved to be very successful by both the emission and absorption methods. Absorption methods, because they are related to ground state atom populations, provide a wider scope for analytical studies because the population of the ground state atoms are less variant with temperature than the excited atoms of emission methods and present in much larger numbers. The analytical application of absorption method was first developed by Walsh (1).

Although the atomic absorption method make a wide range of metal analyses possible, some are still hampered by chemical interferences to some extent. As was pointed out by Walsh the interelement effects especially compound formation still occurred under the analytical condition in atomic absorption. Effects are of two types, the first is due to the foreign atom presented in the system and capable of forming stable compound in the flame. Second is due to the reactive flame species such as OH, H or O, these can also form

stable compounds in the system under investigation. One of the severe cases is in the determination of calcium, Hwang and Sandonato(2) observed the depressive effects by aluminium and iron in all flame conditions.

In the case of alkali metals,although their behaviour in the flame are well known but very little work has been done with its interferences. Most of the published papers were concentrated in their determination with the presence of alkali metals or anions which occurred naturally together. David (3) reported that 160 ppm. aluminium phosphate,sulfate and silicate did not interfere with 2-10 ppm sodium but higher concentration of sodium, the interfering effect is severe. For interelement interferences between alkali metals little work has been done. Willis (4) noted that the slight enhancement of potassium absorbance by sodium becomes constant if a large excess is added to samples and standards. However,in the literature there is yet no complete study of the interferences of alkali metals with each other.

In the present work,it was undertaken to study the interelement interferences behaviour between alkali metals using atomic absorption spectroscopy. With reference to thermodynamic stabilities,it is our work to try to discuss the chemical interferences observed in terms of ionization and compound formation which are known to occur for

alkali metals in flames. The absorptions of lithium, sodium and potassium were measured in the presence of varying amounts of other alkali metals. Hollow cathode lamps for rubidium and caesium unfortunately were not available for this work.