ABSTRACT

This thesis comprises of five chapters. In first chapter, a detailed and up to date survey of literature on the subject has been reviewed. In addition, the studies on the methods for detection and spectrophotometric determination of organic compounds in pharmaceutical preparations have been described. The colour reactions of a number of functional groups via spot test have been studied. The utility of resin bead technique has been discussed for identification of different functional groups. Resin beads have been utilized in the form of their dual role i.e. as a detection medium and a medium to catalyse or to bring about a chemical reaction. Hence, resin spot test has been applied to make the detection more sensitive and free from interfering species. The employment of well known instrumental technique namely spectrophotometry has been achieved for determination of substances, and the drugs in particular.

The second chapter includes the analysis of ascorbic acid in pharmaceutical preparations through resin bead detection and spectrophotometric determination. A colour reaction of this compound has been developed with m-dinitrobenzene in presence of sodium hydroxide. The reaction obeys Beer's law in concentration range 0.01 to 0.25 mg of ascorbic
phenylbutazone, propyphenazone, codeine and a number of other excipients and can be tolerated up to an amount of 1 mg of each whereas analgin, oxyphenbutazone, phenacetin, phenazone salicylate and nicotine interfere with the test. The present method has been employed for the determination of paracetamol in various pharmaceutical preparations. The method is reproducible with relative standard deviation of 2.35%. The molar absorptivity has been found to be $1.5 \times 10^5$ mole$^{-1}$cm$^{-1}$. The Beer's law obeys in the concentration range of 0.1 - 0.5 mg paracetamol.

In the fourth chapter, an indirect colour reaction has been studied for detection and determination of novalgin in tablets. Novalgin is detected by sorption technique and determined spectrophotometrically by developing the colour with potassium iodate. The detection limit is 5 μg. Beer's law is obeyed in the concentration range of 0.1 to 1.0 mg per 5 ml.

In the last chapter the conditions have been studied for the determination of 1-naphthol through oxidative oxidation. The oxidation product is a violet compound that absorbs maximally at 520 nm. Beer's law is obeyed in the concentration range of 0.01 - 0.4 mg of 1-naphthol. The method is specific and has been found to be accurate with standard deviation of 1.66%. A tentative reaction mechanism has also been proposed.
acid. The detection limit is 10 µg. The method is found to be accurate with a relative standard deviation of 2.12%. The molar absorptivity has been found to be 1.35 X 10^5 1 mole^{-1} cm^{-1}. A tentative reaction mechanism has also been proposed. The method is selective for ascorbic acid as vitamin B complex does not give positive test. A negative test was given by functional groups such as carbohydrates, carboxylic acids amino acids, aldehydes, ketones, alcohols, reducing compounds like hydrazine, phenylhydrazine, hydroxylamine, mercaptoacetic acid and trichloroacetic acid. The determination of ascorbic acid in the presence of a number of foreign substances has been studied.

In the third chapter spectrophotometric determination of paracetamol has been discussed. For the determination of paracetamol, the procedure is as follows. To an aliquot volume of paracetamol prepared in dioxane containing 0.1 to 0.5 mg add 0.3 ml of 5% ceric ammonium nitrate (that is prepared in 5 M nitric acid) in a 5 ml standard volumetric flask. Make the solution upto the mark with dioxane. Allow the reaction mixture to stand about 10 minutes to develop a yellow colour. Measure the absorbance of resulting yellow coloured product at 355 nm against a blank solution. The method has been found to be unaffected by presence of aspirin,