CHAPTER VI
CONCLUSIONS
The synthesis, characterization and analytical properties of a new \( \beta \)-dithiosemicarbazone viz. 2-nitro-5,6-dimethyl-1,3-indanedione dithiosemicarbazone (NDIDT) are presented in this dissertation.

Though NDIDT gives coloured complexes with cobalt(II), nickel(II), ruthenium(III), palladium(II), osmium(VIII), platinum(II) and gold(III), the molar absorptivities of cobalt(II), palladium(II) and osmium(VIII) complexes are sufficiently high for the selectivity.

The utility of NDIDT as chromogenic reagent for the spectrophotometric determination of cobalt(II), palladium(II) and osmium(VIII) is carefully assessed by studying the complex formation reactions and different parameters viz. effect of pH, effect of NDIDT, Beer’s law, effect of foreign ions, time and order of addition of reagents.

The colour reactions are quite rapid and require no heating for full colour development.

NDIDT seems potentially useful for cobalt determination. The spectrophotometric method developed for cobalt has been applied for the analysis of alloys.

NDIDT gives redox reactions with chromium(VI), iodate and bromate. These redox reactions involve a two electron mechanism in accordance with general redox behaviour of bisthiosemicarbazones. Based on the difference in spectral characteristics of the products obtained by oxidation with chromium(VI), bromate and iodate, two different oxidation products (viz. intramolecular and intermolecular) are assigned which is in analogy with previous observations.