One of the rapidly developing areas of analytical chemistry is its application to complex materials like environmental samples, biological materials and alloy steels.

One of the techniques which is simple and readily in the reach of all laboratories of developing and developed countries is photometry. This technique is fairly simple and useful for the determination of trace amounts of constituents in the presence of bulk quantities of other elements.

The choice of spectrophotometric method for the determination of any element generally depend on (i) availability of reagent in reasonable pure state, (ii) specificity, selectivity and sensitivity of the procedure, and (iii) stability of the coloured species.

Thiosemicarbazones have been frequently employed as chromogenic reagents for the spectrophotometric determination of inorganic ions and their analytical potentialities have been reviewed\(^1,2\). Mono-thiosemicarbazones with an electron donating group in the \(\alpha\)-position and \(\alpha\)-bis thiosemicarbazones have been widely studied\(^2\).

During the course of investigations in our laboratories \(\beta\)-dithiosemicarbazones have been found potentially useful for the spectrophotometric determination of inorganic ions\(^3-6\).

Indane derivatives viz. indane-1,2,3-trione monosemicarbazone\(^8,9\) indane-1,2,3-trione trioxime\(^10,11\) and 5,6-dimethyl-1,3-indanedione-2-oxime\(^1\) have been prepared. The analytical application of these reagents for the spectrophotometric determination of metal
ions by complex formation reactions has been explored. 5,6-Dimethyl-1,3-indanedione dithiosemicarbazone (DID) was also prepared in our laboratories. It has poor solubility in organic solvents like dimethylformamide, dimethylsulphoxide and ethanol. Hence, the utility of DID is beyond the reach of spectrophotometric analysis. The nitro derivative obtained from DID by substitution of nitro group at second position of indane ring found to be fairly soluble in dimethylformamide and thus the reagent could be used for spectrophotometric analysis of some metal ions. Hence 2-nitro-5,6-dimethyl-1,3-indanedione dithiosemicarbazone (NDIDT) has been prepared. The analytical properties of NDIDT have been explored. NDIDT gives coloured complexes with cobalt(II), nickel(II), copper(II), ruthenium(III), palladium(II), osmium(VIII), platinum(IV) and gold(III). Cobalt(II), palladium(II) and osmium(VIII) complexes of NDIDT have attracted special attention due to their higher sensitivities. Hence the complex formation of NDIDT with Co(II), Pd(II) and Os(VIII) were studied in aqueous medium systematically to derive physico-chemical and analytical properties of NDIDT complexes.
REFERENCES