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NOTES

Preparation of Tris(dimethyldithiocarbamato) Iron(III) and Its Effect on Seed Germination

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Tris(dimethyldithiocarbamato) iron(III) has been prepared from the corresponding sodium salt by the reaction with ferric chloride, in dichloromethane/water medium. When moong *(Phaseolus mungo)* seeds are treated with dilute solutions of the complex in chloroform, there is a marginal increase in the metabolic activity.

Thiocarbamates have been used widely as analytical reagents[1]. A large number of dithiocarbamates have been prepared by the direct reaction of the metal salts and thiocarbamic acid[2]. Some of the transition metal complexes are being investigated for their biological activity[3]. We have prepared tris(dimethyldithiocarbamato) iron(III). The dilute solution of this complex when applied to the moong (*Phaseolus mumgo*) seeds, increases the size and dry weight of the moong plants as compared to the control.

Preparation of tris(dimethyldithiocarbamato) iron(III)

Sodium dimethyldithiocarbamate (4.5 gm) was added to ferric chloride (1.6 gm) dissolved in 100 ml of water/dichloromethane (1 : 1 v/v) and was allowed to react vigorously for 2–3 hrs. The organic layer is separated and allowed to stand over K_2SO_4 (anhydrous) overnight. The organic layer is evaporated to form a saturated solution, from which the crystals of tris(dimethyldithio-carbamato) iron(III) are formed. These crystals are dried under vacuum.

Sodium dimethyldithiocarbamate and anhydrous ferric chloride react vigorously when mixed in dichloromethane/water mixture. The corresponding ferric salt can be crystallised from the organic layer. It is a black coloured crystalline compound. It is not soluble in water but slightly soluble in ethanol, benzene, ethylacetate and chloroform, indicating it to be a polymer. The elemental analysis of the compound corresponds to the tris(dithiocarbamato) iron(III).

The infrared spectra of the compound shows a sharp band at 1480 cm^{-1} corresponding to thioureide bond[4]. The band at 980 cm^{-1} has been assigned[5] to ν(C=S). The absorption corresponding to ν(C–N) has been observed[6] at 1390 cm^{-1}.

Effect on seed germination

Overnight soaked seeds of moongbean when applied with different concentrations of tris (dimethyldithiocarbamato) iron(III) (0.001–0.03 ppm) and grown for ten days in pots, the 0.015 ppm concentration treated seeds resulted in the maximum increase in shoot length (21.5 cm) as compared to 18 cm shoot length of the control. The same concentration exhibited maximum yield of dry matter (269 mg/plant) as compared to control (216 mg/plant).

The increased deposition of dry matter may thus be attributed to the enhanced photosynthetic activity. The further work on this aspect is in progress.

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