DETECTION OF TWO PHOSPHORUS CONTAINING ANACARDIC COMPOUNDS BY PAPER CHROMATOGRAPHY

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A method based on paper chromatography is developed for detection and determination of *tris*-tetrahydroanacardoxy phosphite and *tris*—(2 terat-hydroanacardoxyethyl)—phosphite. The *RF* values for these compounds in four solvent systems are recorded.

In the preceeding communication[1] the preparation of two organophosphorus compound *viz.* *tris*-tetrahydroanacardoxy phosphite (I) and *tris*-(2-tetrahydroanacardoxyethyl)—phosphite (II) from tetrahydroanacardol (III) Fig. 1 are reported. In analogy with similar compounds of 2, 4—dichlorophenoxyacetic acid (2, 4-*D*), 2, 4, 5-trichlorophenoxyacetic acid (2, 4, 5-T) (well known herbicides[2]), these are expected to exhibit pesticidal and herbicidal activity. As these phosphorus compounds are known to leave residues on food materials, their detection and estimation is considered necessary and a method based on paper chromatography is reported in this communication.

EXPERIMENTAL PROCEDURE

Whatman No. 4 filter paper is the stationery phase. The following solvent systems are the mobile phases in different experiments.

(*i*)	Butanol-acetic-acid-water	(4 : 1 : 5 V/V)
(*ii*)	Butanol-pyridine-water	(1 : 1 : 1 V/V)
(*iii*)	Ethylacetate-acetic acid-water	(14 : 3 : 3 V/V)
(*iv*)	Benzene-acetic acid-water	(62 : 36 : 1·5 V/V)
(*v*)	Chloroform-ethenol-water	(5 : 5 : 3 V/V)
(*vi*)	Isopropanol-ammonia-water	(20 : 1 : 2 V/V)
(*vii*)	Butanol-water	(4 : 1 V/V)

The compounds on paper are detected in two ways :

(*i*) The portion of the paper containing the compound is exposed to iodine vapours whereby a brown coloured band (transient) is developed[3].

(*ii*) A chromogenic reagent[4], consisting of aqueous ammonium molybdate, 1-amino napthol-4-sulphonic acid, sodium sulphite, sodium bisulphite, acetone and sulphuric acid is swabbed on the paper with cotton whereby permanent blue coloured bands are developed on those portions where the compounds rest. The blue coloured material is in turn extracted from paper with water and the presence of phosphorus detected on Hilger Biochem absorptiometer at 660 mμ[4].

TABLE 1

RF VALUES OF ORGANO-PHOSPHOROUS ANACARDOXY COMPOUNDS

Solvent system	Circular paper chromatography		Descending paper chromatography	
	I	II	I	II
Butanol-acetic-acid-water	0·47	0·45	0·03	0·03
Butanol-pyridine-water	0·62	0·32	0·72	0·14
Ethylacetate-acetic acid-water	No clear value	0·23	..	..
Benzene-acetic acid-water	0·97	0·92	..	..
Chloroform-ethenol-water	No clear values due to non-movement			
Isopropenol-ammonia-water	—do.—			
Butanol-water	—do.—			

The technique of circular and descending paper chromatography of compounds I and II (Fig. 1) in the above mentioned solvent systems is employed and the *RF* values in each case are recorded in Table 1. An attempt has been made to separate a 1 : 1 mixture of I and II. Since the *RF* values of these compounds are closer in butanol-acetic acid-water and benzene-acetic acid-water, an effective separation could not be achieved; however, in butanol-pyridine-water, a satisfactory separation of I and II was found to be feasible both in circular and descending chromatography. In the case of ethyl acetate-acetic acid-water system, the *RF* value of I could not be given as the band separated enormuosly on the paper. There were no movements of the substances at all from the starting point in solvent systems chloroform—ethanol-water, isopropanol-ammonia-water and butanol-water, hence no *RF* value could be given. By this technique minimum of 20 μg and 10 μg of Iand *II* respectively could be determined[4].

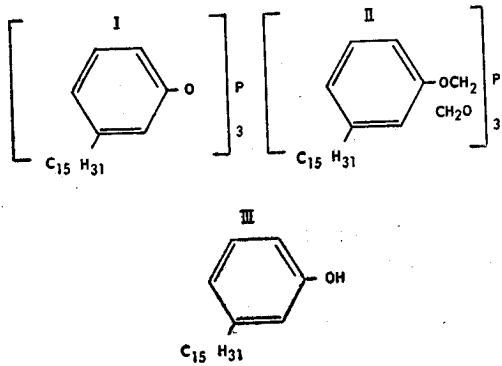

Fig. 1—Anacardoxy Compounds

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