

CHROM. 5692

Separation of some terphenylquinone and tetronic acid derivatives by thin-layer chromatography

Existing TLC procedures for the separation and detection of terphenylquinones and tetronic acid derivatives are generally unsatisfactory. Several investigators¹⁻³ have reported a number of different TLC systems for the separation of these compounds but in all cases one or more derivatives remain at the origin or considerable tailing results.

A biogenetic relationship between polyporic acid and calycin has been reported⁴ which further establishes the need for a rapid and reproducible method for the separation and detection of terphenylquinones and tetronic acids.

Experimental

Thin-layer plates. TLC plates were prepared according to STAHL⁵ using a 250 μ layer of Silica Gel G (E. Merck). The plates were allowed to air-dry for 30 min at room temperature prior to activation in an oven at 110° for an additional 30 min.

Solvents. All solvents utilized were analytical grade. The following solvent systems were employed: (I) benzene-ethyl formate-formic acid (13:5:4); (II) methanol-0.30 M oxalic acid dihydrate in methanol-formic acid (100:2:0.1).

Reference compounds. All reference compounds used in this investigation are listed in Table I.

Detection. All terphenylquinones and tetronic acids used in this investigation are pigmented compounds, as indicated in Table I. Detection was accomplished by visualization. In addition, long-wave UV light was employed to differentiate tetronic acids from terphenylquinones, since the former compounds exhibit a characteristic fluorescence.

Results

Our work with the representative compounds listed in Table I has resulted in the development of two TLC systems, each of which gives reproducible and discrete

TABLE I

CHROMATOGRAPHIC ANALYSIS ON SILICA GEL G

Solvent systems: (I) benzene-ethyl formate-formic acid (13:5:4); (II) methanol-0.30 m oxalic acid dihydrate in methanol-formic acid (100:2:0.1).

Compound	R_F values		Spot color
	Solvent system I	Solvent system II	
Thelephoric acid	0.00	0.44	black
Atromentin	0.45	0.70	brown
Atromentic acid	0.50	0.87	yellow
Volucrisporin	0.58	0.89	orange
Aurantiacin	0.70	0.89	orange
Pulvinic acid	0.78	0.86	yellow
Polyporic acid	0.86	0.70	purple

separation. The description and results of these systems are shown in the *Experimental* and Table I.

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Received August 3rd, 1971

J. Chromatogr., 63 (1971) 457-458