

The separation of some pairs of allylic-propenylic isomers by TLC on silica impregnated with silver nitrate

The capacity of olefins to complex selectively with silver cations has been exploited in many analytical techniques. The application of this principle to TLC opens many interesting possibilities when using chromatoplates impregnated with AgNO_3 .

Our experimental data (Table I) show that some allylic derivatives of benzene or cyclohexene can be easily separated from their propenylic isomers by means of

TABLE I

SEPARATION OF ALLYLIC DERIVATIVES OF BENZENE AND CYCLOHEXENE FROM THEIR PROPENYLIC ISOMERS

The chromatoplates were 300 μ thick. For SiO_2 chromatoplates activation was 20 min at 120°. $\text{SiO}_2 + \text{AgNO}_3$ chromatoplates were prepared by stirring 25 g of SiO_2 with 70 ml of 12.5% aqueous AgNO_3 solution (for five 20 \times 20 cm plates); activation 30 min at 60°. Development reagents: for SiO_2 substrate, phosphomolybdic acid at 100°; for $\text{SiO}_2 + \text{AgNO}_3$ substrate, vanillin reagent at 140°.

Compound	Substrate		Eluant
	Silica gel G (Merck)	Silica im- pregnated with silver nitrate	
Pulegone	0.37	0.41	Benzene + 0.75 % methanol
Iso-pulegone	0.43	0.18	
Estragole	0.66	0.51	Benzene
Anethole	0.68	0.67	
Eugenol	0.42	*	Benzene + 1 % methanol
Iso-eugenol	0.42	*	
Eugenyl acetate	0.51	0.32	Benzene + 1 % methanol
Iso-eugenyl acetate	0.51	0.51	
Safrole	0.57	0.29	Petroleum ether-benzene (1:1)
Iso-safrole	0.57	0.57	

* The compounds react with AgNO_3 and reduce it on the plate.

this technique. Under the test conditions only allylic isomers should be able to form π -complexes with AgNO_3 ¹, since propenyl derivatives showed about the same R_F values both on SiO_2 and on $\text{SiO}_2 + \text{AgNO}_3$ chromatoplates.

This method is quick and accurate and offers a good alternative for separation and identification of this type of isomer.

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