Table 18 TLC of Amino Acids on Impregnated Silica Gel Layers

Solvent system	Ratio	Impregnation	Ref.
Isoamyl alcohol–H_2O–HOAc	6:5:3	Pyridinium tungstoarsenate	150c
H_2O–EtOAc–MeOH	64.3:5.7:30	Silanized silica and triethanolamine, SDS, sodium dioctyl sulfonate, dodecylbenzenesulfonic acid	150d
0.1 M HOAc in aq. 50% MeOH		Dodecylbenzenesulfonic acid	150e
aq. MeOH + I_2 (KCl or HOAc added)		Ammonium tungstophosphate and dodecylbenzene sulfonic acid	150f
aq. NH_4NO_3 or HNO_3 or H_2O–HOAc–MeOH (79:1:20)		Ammonium tungstophosphate	150g
H_2O		Polyamide	150h
H_2O–butanol–anhyd. HOAc	4:4:2	Kieselguhr or cellulose	150i
n-Butanol–acetic acid–water	4:1:5	Starch–agar (1:1)	150j
Propan-2-ol–EtOAc–acetone–methanol–*n*-pentyl alcohol–aq, 26% NH_3–water, in first direction; and Butanol–acetone–propan-2-ol–formic acid–water, in second direction	9:3:3:1:1:3:3 18:8:8:3:6	Cellulose	150k
1 M NH_4NO_3–0.1 M HNO_3		Ammonium tungstophosphate	150l
MeOH–butyl acetate–HOAc–pyridine	4:4:2:1	Copper sulfate and polyamide	13
n-Butanol–acetic acid–$CHCl_3$	3:1:1	Cl^-, Br^-, I^-	23
n-Butanol–acetic acid–ethanol	3:1:1	Hydroxides of Mg, Ca, Ba, Sr	24
Butyl acetate–MeOH–HOAc–pyridine	4:4:1:1	Zn^{2+}, Cd^{2+}, Hg^{2+}	25

VI. RESOLUTION OF ENANTIOMERIC MIXTURES OF AMINO ACIDS AND THEIR DERIVATIVES

The measurement of specific rotation is a common and accepted method for evaluating the enantiomeric purity of chiral compounds. The determination of the enantiomeric excess (ee) value is influenced by the presence of impurities and changes in concentration, solvent, and temperature (151) and requires the $[\alpha]_D$ value for the pure enantiomer. The availability of a reliable optically pure standard would depend on the analytical method by which it had been resolved from the enantiomeric or racemic mixture of the compound in question. Though TLC provides a direct method for resolution and analytical control of enantiomeric purity, there are few reports on thin-layer chromatographic separation of enantiomers.

In general, three approaches have been applied to the TLC resolution of enantiomers: use of a chiral selector as impregnating reagent mixed with the adsorbent, e.g., silica gel; immersing or developing the plate in a solution of chiral selector prior to sample application; and use of a chiral mobile phase. Yuasa et al. (152) reported the TLC separation of D,L-tryptophan on a crystalline cellulose–coated plate. Weinstein (153) resolved nine dansyl amino acids as follows. Reversed-phase TLC plates from Whatman were developed prior to application of dansyl amino acids in buffer A (0.3 M sodium acetate in 40% acetonitrile, and 60% water adjusted to pH 7 by acetic acid). After "fan-drying," the plates were immersed in a solution of 8 mM *N,N*-di-*n*-propyl-L-alanine and 4 mM cupric acetate in 97.5% acetonitrile and 2.5% water for 1 h or overnight and left to dry in the air. After the samples were applied, the plates were developed in buffer A with or without *N,N*-di-*n*-propyl-L-alanine (4 mM) and cupric acetate (1 mM) dissolved in it. The enantiomers were detected by irradiating with UV light (360 nm) to yield fluorescent yellow-green spots. Use of 25% acetonitrile was preferred for glutamic and aspartic acids and serine and threonine derivatives. *N,N*-Di-*n*-propylalanine can be prepared by following Bowman and Stroud's