thin-layer chromatography have a low specific surface area, they are applied mainly in partition chromatography, especially for the separation of relatively polar compounds.

Often cellulose thin layers need no binders because of the strong hydrogen bonding of the cellulose hydroxyl groups with the supports used. Care must be exercised in the preparation of cellulose layers, because the slurry needs to be mixed carefully so as not to break the fibers, which would give a much more slowly running TLC plate.

Separations on cellulose of some important substance classes are listed in Table 6.

E. Polyamides

Another organic sorption material for thin-layer chromatography is polyamide. In contrast to celluloses, polyamides are synthetic organic resins. Two types of polyamides are used: polyamide 6 and polyamide 11. Polyamide 6 consists of a polymeric caprolactam, whereas polyamide 11 is a polyundecanamide. Polyamides are synthesized as coarse granules. To get a particle size distribution suitable for thin-layer chromatography, two different techniques are applied: (a) grinding at low temperature and (b) temperature-programmed precipitation after dissolution of the granules.

Both types of polyamides for thin-layer chromatography are available as bulk TLC materials and as precoated layers on various supports (glass, plastic, aluminum). The particle sizes are in the same ranges as those of other sorbents. Polyamides are applied for the separation of polar compounds, which are able to interact with the amide group by hydrogen bonding because of their molecular structure. This is why substance groups such as amino acids and derivatives (96,97), benzodiazepines (98), carboxylic acids (99), cyclodextrins (100), fatty acids (101), flavonoids (65), food preservatives (102), and peptides (103) can be separated on polyamide TLC layers. A special application for polyamide layers is the separation of isomeric compounds with the addition of cyclodextrins to the eluent (104).

F. Sephadex

Sephadex materials used in thin-layer chromatography are cross-linked, polymeric dextran gels. Some physical and chromatographic properties of these Sephadex gels are listed in Table 7.

Sephadex gels are available in four particle size distributions:

Coarse	100–300 μm
Medium	50–150 μm
Fine	20–80 μm
Superfine	10–40 μm

These data refer to the dry gel. Only the superfine fraction is suitable for application in thin-layer chromatography. The hydrophilic Sephadex gels can be applied only in a totally swollen condition as chromatographic sorbents. Because they are used only in size-exclusion chromatography, Sephadex materials in thin-layer chromatography have to be applied with the aid of continuous development techniques. A typical application of size-exclusion thin-layer chromatography on Sephadex gels is the fast and simple determination of molecular weights of proteins (105).

III. MODIFIED SORBENTS AND PRECOATED PLATES

A. Chemically Modified Sorbents

One of the most important factors in achieving a successful separation is the correct combination of solvent and sorbent. Innumerable solvent combinations are possible in TLC, but the sorbent need not only be silica gel. For many years, silica gel, and to a lesser extent aluminum oxide and cellulose, were the only sorbents available for making a TLC plate. However, an ever-expanding choice of sorbents and their unique selectivities became available when modifications began to