



**Figure 1** Sugars in dairy products (yogurts). Documentation of a developed TLC plate with an image analyzing system. Conditions: Silica gel HPTLC plates; acetonitrile–phosphate buffer pH 5.9 (85:15) solvent system containing 0.05% NST; two developments; detection by aniline 2%–diphenylamine 2%–phosphoric acid (85%) 15% in methanol (ADP reagent), activation 5 min at 120°C. Sugars (in order of migration): Lac, Suc, Gal, Glc, Fru. Video system: Javelin JA3622X; PC/FS200; thermal printer Toshiba.

gram. Laboratory synthesis of neoglycolipids using oligosaccharides released from complex carbohydrates has important applications in determining some carbohydrate structures by such techniques (2,21a). Examples of the above-mentioned applications are discussed in subsequent sections, as appropriate.

## II. SAMPLE PREPARATION PRIOR TO TLC ANALYSIS

Sample preparation is the most critical aspect of chromatographic analysis. Improper treatment of the sample before analysis is one of the most frequent causes of erroneous or misleading results in the chromatographic separation. Samples for carbohydrate analysis can be derived from many different sources, and there is no universal method for sample preparation. Sometimes samples can be applied to a TLC plate directly, but biological or environmental samples are often complex, dilute, or incompatible with the chromatographic system and do not permit direct application. In most instances, some purification and/or concentration of the sample components of interest is needed before analysis. Biological material frequently requires a digestion step for release of carbohydrate moieties from glycoconjugates or the hydrolysis of complex sugars to more easily identifiable monosaccharides. These additional procedures may affect the performance of the analytical method. Therefore, they should be evaluated for each application and optimized as appropriate (21b). Additional descriptions of sampling and cleanup procedures of specific samples such as clinical and biological specimens are as referenced in the original articles (22–24).

### A. Solutions

Solutions of appropriate concentrations can be spotted on TLC plates without any pretreatment except for filtration through a 0.45–0.8  $\mu\text{m}$  pore-diameter filter to remove particulates. However,