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NO. 210 FAST CARBOHYDRATE SEPARATIONS ON AMINE MODIFIED SILICA COLUMNS

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Carbohydrates are among the most abundant compounds found in nature, and the analysis of carbohydrates and carbohydrate mixtures is of considerable and growing importance in chemical and biological research as well as the food industry.

Many different analytical techniques have been utilized for the separation and quantitation of carbohydrates. These include paper chromatography, thin-layer chromatography, enzymic analysis, gas-liquid chromatography and high-performance liquid chromatography. Of these, HPLC has been shown to be the most convenient, allowing for ease of use as well as rapid and simultaneous separation and quantitation of carbohydrates without sample derivatization.

Waters introduced the first bonded phase "Carbohydrate" column for the analysis of carbohydrates by HPLC in 1975 (1).

Aitzetmuller in 1978 (2) followed by Wheals and White in 1979 (3) reported a new HPLC technique for the analysis of carbohydrates with amine modified silicas. In 1981, Baust, Hendrix and co-workers (4) further reported the use of Radial-PAK™ silica cartridges treated with an amine allowing for greater column lifetime at the basic pH's (>9.0) required for the amine modified silica carbohydrate analyses.

In this paper we discuss the fast separation of carbohydrates with Silica Radial-PAK™ cartridges treated with two new amine modifiers (SAM™-1 and SAM™-2). SAM™-1 allows for the fast separation of mono-, di-, and trisaccharides whereas SAM™-2 allows for the separation of monosaccharides not previously separated by an amine modified silica technique. Examples of food and beverage analyses will be presented to demonstrate the usefulness of these two new amines with the amine modified silica technique for the analysis of carbohydrates.

1. J. K. Palmer, Analytical Letters, March 1975.
2. K. Aitzetmuller, J. Chromatogr., 156 (1978) 354.
3. B. B. Wheals and P. C. White, J. Chromatogr., 176 (1979) 421
4. D. L. Hendrix, R. E. Lee, Jr. J. G. Baust and H. James, J. Chromatogr. 210 (1981) 45.