SCOLECITE AS A NEW ADSORBANT FOR THE CHROMATOGRAPHIC SEPARATION OF PHOSPHOLIPIDS

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SCOLECITE (zeolite), a crystalline hydrated aluminium-silicate of alkali metal has a three-dimensional anion network and has been used in this study as a new adsorbant for separation of phospholipids by thin layer chromatography. Zeolites[1] are hydrated alumino-silicates of the alkali and alkaline earth metals having Ca in their framework. Zeolites have an alumino-silicate framework composed of three-dimensional network of AlO_4 and SiO_4 tetrahedra linked to each other by oxygen atoms. The separation of phospholipids using silicagel has been reported earlier[2–4]. Zeolite sample from Pawagad[5], near Varodara area in Gujarat was used as an adsorbant medium for the separation of biologically important phospholipids and their mixtures.

The purity of scolecite was confirmed by physico-chemical methods before use. Lipid spots were detected using agents like Iodine vapours, 0.15% rhodamine B in alcohol and Dragendorff's solution. Of the many solvent-systems tried the following was found to be suitable: chloroform: methanol: ammonia (75:25:1 v/v). On the thin layers of scolecite pure phospholipids were chromatographed using the solvent-system $\rightleftharpoons$ chloroform/methanol/ammonia (75:25:1). All the phospholipids (table 1) migrate less on scolecite than on silicagel.

Lysolecithin is retained on scolecite, with the result that lysolecithin is separated easily from the rest of phospholipids from binary, ternary and quaternary mixtures.

Table 1 *Rf values of phospholipids on scolecite layer using chloroform: methanol: ammonia 75:25:1 (v/v) as solvent system*

Phospholipids	Scolecite	Silicagel
Lysolecithin	Retained	0.35
Lysophosphatidyl ethanolamine	0.12	0.51
Lecithin	0.48	0.83
Phosphatidyl ethanolamine	0.75	0.90

The highlight of this work is a clear separation of lysolecithin (remaining at the origin), lysophosphatidyl ethanolamine (rf = 0.12), lecithin (0.48), and phosphatidyl ethanolamine (rf = 0.75) from one another on scolecite and the time taken is 90 to 120 sec.

Our results show that scolecite (zeolite) may be a better adsorbant medium (TLC material) for phospholipids than silicagel. Further, it has the following additional advantages over silicagel: (i) Spots of phospholipids are more sharp and clear and easily identifiable on scolecite layers than on silicagel; (ii) Scolecite layer adheres more tightly on glass plates even without the use of binders like gypsum etc; (iii) Sharper and clearer separation of phospholipids was achieved at a shorter interval of time on scolecite layer; (iv) The use of scolecite for the separation of organic acids, amino acids, carbohydrates[6] for textile dyes[7] and food dyes[8] has been reported.

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