Thin Layer Chromatographic Mobility of Some Porphyrin Derivatives and Their Chelates

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Porphyrin is a group of chemical analogues possessing a macrocycle, which consists of four pyrrole rings linked by methane bridges and gives rise to their characteristic separation (Soret band) with intense absorption in visible region (400-500 nm)[1]. Chromatography has been effectively used for the purification and separation of synthetic porphyrin compounds and their metal complexes. The migration of porphyrin derivatives in thin layer chromatography depends on the nature of their substituents. This work was dealt with the chromatographic behaviour of some newly synthesized porphyrin derivatives and their metal chelates on silica gel and RP plates using different mobile phases. Tetraphenoxyphenyl porphyrin (TPPP), tetrachlorobenzyl porphyrin (TCIBP) and tetra o-bromohydroxyphenyl porphyrin (TBrHPP) were synthesized and characterized. Metal chelates of these porphyrins were prepared in aqueous-THF solution. Chromatographic behaviour of porphyrins and their metal chelates on silica gel 60F254 and RP18 plate using certain development solvent mixtures were investigated using Camag TLC scanner 3. The migration behaviour of substituted porphyrins except TCIBP was found similar. Benzylchloro porphyrin was weakly adsorbed on silica gel using either polar or nonpolar mobile phases. The retardation factor values of TPPP and TCIBP were good in development solvent systems having moderate polarity. Their metal chelates migrated more than their chelating agents. The separation of Cu(II), Co(II), Ni(II), Zn(II), Hg(II) and Pb(II) chelates from each other was mostly achieved on silica gel plate.

References