

**THIN LAYER CHROMATOGRAPHY  
AS MODEL SYSTEM FOR INVESTIGATION OF THE MOBILITY  
OF METALS IN SEDIMENTS. II**

S. ISKRIC, B. SPOLJAR and O. HADZIJA

Ruder Boskovic Institute, P.O. B. 1016, Zagreb, Croatia

In soil and sediments, organic and inorganic components are closely connected by forming salts and complexes and the consequence of these interactions is moving or sedimentation of metals. In the present work we examined, by the use of model experimental system, the behaviour of some toxic heavy metals (Pb(II), Cu(II), Cd(II), Zn(II)) in interaction with compounds, simulating the probable structure of humic acids.

The model system was chromatography of benzene derivatives of typical structures on thin layer of silica gel impregnated with metal salts and with tap water as the mobile phase. On the basis of the behaviour, i.e.  $R_f$  values, some conclusions about the solubility and consequently mobility of the complexes formed could be drawn.

All the model compounds except resorcinol show at the start position one spot, what may indicate their partial retardation effect. Resorcinol moved considerably indicating that the hydroxy groups improved the mobility of the metals. Other compounds tested beside the spot on the start position exhibit another spot having higher mobility. This was observed with benzoic and syringic acids on Pb(II), Cd(II) and Zn(II) impregnation and with o-phthalic acid and salicylic acid on Cu(II), Cd(II) and Zn(II) impregnation. One can conclude that with exception of resorcinol the model compounds formed with the support two kinds of complexes - one improving the mobility and the other retarding the metals.

Table 1.  $R_f \times 100$  values of hydroxy and carboxy benzene derivatives on Cu(II)-, Pb(II)-, Cd(II)- and Zn(II)-impregnated silica gel plates. Developer: tap water

Compound	Structure	$R_f \times 100$							
		Impregnant: Cu(II)		Pb(II)		Cd(II)		Zn(II)	
		$R_f$	$R_f$	$R_f$	$R_f$	$R_f$	$R_f$	$R_f$	$R_f$
Benzoic acid		11	-	7	70	0	67	0	77
o-Phthalic acid		7	50	18	-	10	55	9	58
Syringic acid		0	-	13	74	0	68	5	86
Salicylic acid		7	32	6	64	6	65	7	62
Resorcinol		-	49	-	69	-	77	-	74

