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Note

Paper chromatography of radiopharmaceuticals labelled with indium-113m

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Radiopharmaceuticals labelled with ^{113m}In are widely used for organ scanning and it would therefore be useful to have a simple, rapid and reliable method for determining their radiochemical purity. Paper chromatography provides such a technique.

We have previously reported¹ on the use of 3% sodium chloride solution as a solvent for the identification of ^{113m}In -DTPA (diethylenetriaminepentaacetic acid). This solvent has not been found suitable, however, for ^{113m}In -colloid and ^{113m}In -gelatin complexes. Various other solvents have been tried in the paper chromatography of these compounds and the results are reported in this communication.

EXPERIMENTAL

Indium-113m generators of 50 mCi each were obtained from the Radiochemical Centre, Amersham, Great Britain, and the Bhabha Atomic Research Centre, Trombay, India, and were used for the ^{113m}In preparations. The elution was carried out with 0.04 *N* hydrochloric acid and the following radiodiagnostic agents were prepared according to published methods: (1) ^{113m}In -colloid for liver and spleen scanning²; (2) ^{113m}In -DTPA complex for brain scanning³; (3) ^{113m}In -gelatin complex for placental scanning⁴.

Ascending paper chromatography was carried out using Whatman No. 1 paper. Various solvents were tried: (i) methyl ethyl ketone; (ii) diluted hydrochloric acid; (iii) 1-5% sodium chloride solution; (iv) mixture of acetone, 6 *N* hydrochloric acid and water; (v) acetic acid; (vi) acetone-water (3:1); (vii) 1-5% glucose; (viii) 85% methanol; and (ix) various mixtures of methyl ethyl ketone and acetic acid. Of these solvents, only two systems were found to be suitable, *viz.*, methyl ethyl ketone-acetic acid in the proportions 7:3 and 17:3.

RESULTS AND DISCUSSION

The results for solvents, developing time and R_F values are given in Table I. The solvents 85% methanol, 3% sodium chloride solution and 3% glucose worked well for the separation of the ^{113m}In -DTPA complex from free ^{113m}In , but failed to separate the other preparations. With the solvent systems methyl ethyl ketone-acetic acid (7:3) and (17:3), good separations were achieved with all three prepara-

TABLE I
SOLVENTS USED AND R_F VALUES OF ^{113m}In -LABELLED RADIOPHARMACEUTICALS

Compound	Solvent	Time (h)	R_F value	
			Compound	Free ^{113m}In
^{113m}In -colloid	Methyl ethyl ketone-acetic acid			
	7:3	1.5	0.0	0.95
	17:3	1.5	0.0	0.95
	3% NaCl	1.0	0.03	0.03
	85% CH_3OH	1.5	0.03	0.06
	3% glucose	2.0	0.0	0.0
^{113m}In -DTPA	Methyl ethyl ketone-acetic acid			
	7:3	1.5	0.0	0.95
	17:3	1.5	0.0	0.95
	3% NaCl	1.0	0.95	0.03
	85% CH_3OH	1.5	0.44	0.06
	3% glucose	2.0	0.97	0.0
^{113m}In -gelatin	Methyl ethyl ketone-acetic acid			
	7:3	1.5	0.0	0.95
	17:3	1.5	0.0	0.95
	3% NaCl	1.0	0.03	0.03
	85% CH_3OH	1.5	0.03	0.06
	3% glucose	2.0	0.0	0.0

tions. The R_F values of all three radiopharmaceuticals were zero and that of free ^{113m}In was 0.95. In methyl ethyl ketone-acetic acid (17:3), some tailing was observed in a few instances with free ^{113m}In . It is evident from the results that methyl ethyl ketone-acetic acid (7:3) is the most suitable solvent system for use in the determination of the radiochemical purity of the preparations examined.

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