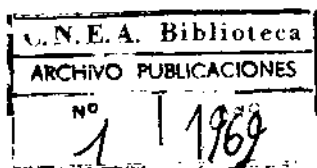


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### Determination of inorganic radioiodide in $^{131}\text{I}$ -labelled compounds by means of thin-layer chromatography

Organic compounds labelled with a radioiodide for use in medical diagnosis or therapy generally contain inorganic radioiodide as their main impurity. According to current regulations, the radioiodide content should never exceed 5 %.

Several techniques are used for the determination of inorganic radioiodide, *viz.* paper chromatography, paper electrophoresis, thin-layer chromatography, precipitation, thin-layer electrophoresis, etc. Several authors, pharmacopeias, Atomic Energy Commissions and commercial firms such as Squibb, Abbott, Amersham, Hoechst, etc. have published on this topic<sup>1-10</sup>.

Using thin-layer chromatography<sup>11, 12</sup>, we have devised a method for separating radioiodide from organic molecules<sup>13-16</sup>. We have tried to reduce the development time of the chromatogram and looked for readily available solvents for use with most of these compounds; 1 N hydrochloric acid was found to be the most suitable.

Chromatograms were prepared by us on glass plates using Silica Gel G (Merck); the chromatogram was developed at ambient temperature and the substances localized by chemical and autoradiographic means. Quantitative determinations were made with a model 7200 Packard Radioscanner, which is capable of detecting 0.5% radioiodide concentrations.

### Experimental

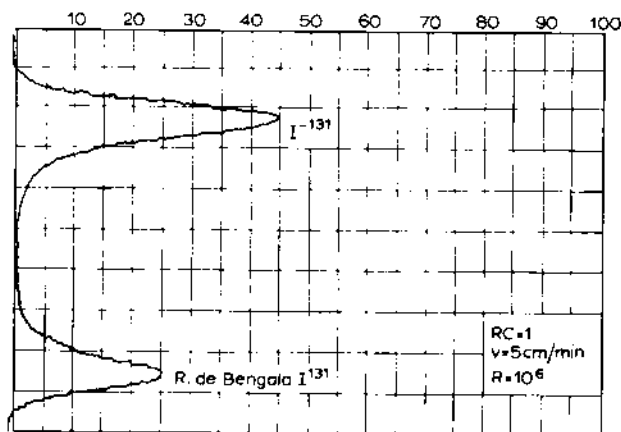
Ascending chromatography was carried out on Silica Gel G (Merck), 250  $\mu$ , using 1 *N* HCl as the solvent. The development was 15 min. The  $R_F$  value of the radioiodide was 0.98-1.00.

Table I lists the  $^{131}\text{I}$ -labelled organic compounds chromatographed with this solvent and the corresponding  $R_F$  values.

Fig. 1 shows the clear separation of the labelled substances from the inorganic radioiodides.

TABLE I  
 $R_F$  VALUES OF  $^{131}\text{I}$ -LABELLED SUBSTANCES

No.	$^{131}\text{I}$ -labelled substance	$R_F$ value
1	<i>p</i> -Aminohippuric acid	0.0
2	Diphenylhydantoin	0.0
3	"Hypaque" sodium	0.0
4	Hippuran	0.25
5	"Urografin"	0.0
6	Albumin	0.0
7	Rose Bengal	0.0
8	"Biligradin"	0.0
9	"Aliminulina"	0.0
10	Insulin	0.0
11	TSH	0.0
12	Sodium iodothalamate	0.04
13	"Diprocon"	0.36
14	Bromosulphalein	0.0
15	Iododeoxyuridine	0.0
16	Chlorambucil	0.0
17	Iodoform	0.0
18	$\gamma$ -Globulin	0.0
19	Congo Red	0.0
20	"Cystokon"	0.0
21	"Telepaque"	0.0
22	Iodoantipirine	0.0
23	Fibrinogen	0.0
24	Bilirubin	0.0
25	Biliverdine	0.0
26	H.G.H.	0.0



The method is considered suitable for rapid control procedures at the plant and in situations where it is not easy to obtain various chromatographically pure solvents.

#### Note

When the experiments are repeated under the same conditions but using glass fibre (ITLC), the displacement times are reduced from 15 min to 3 min for the same distance.

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