

Title	Studies on the Turnover of Phosphorus in Some Tissues with the Use of Radioactive Phosphorus P ³²
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19. An Investigation of the Fused Electrolytic Baths of Cerium Chloride

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Thermal analysis was carried out for binary and ternary mixtures of salts cerium chloride (RCl_3), CaCl_2 , BaCl_2 , and NaCl . The cerium group chloride (RCl_3) used here contains 89% of cerous chloride and 11% of the chlorides of other cerium group metals. The melting point of RCl_3 is 796°C . The binary eutectic points are 78 mol.% of CaCl_2 at 613°C in the system of RCl_3 - CaCl_2 , 31% mol. of BaCl_2 at 683°C in the system RCl_3 - BaCl_2 and 54 mol.% of NaCl at 499°C in the system of RCl_3 - NaCl .

The ternary eutectic points are 30 mol.% of RCl_3 , 49 mol.% of CaCl_2 , 21 mol.% of BaCl_2 at 490°C in the system of RCl_3 - CaCl_2 - BaCl_2 , 21 mol.% of RCl_3 , 48 mol.% of CaCl_2 , 31 mol.% of NaCl at 459°C in the system of RCl_3 - CaCl_2 - NaCl and 36 mol.% of RCl_3 , 42 mol.% of NaCl , 22 mol.% of BaCl_2 at 373°C in the system of RCl_3 - NaCl - BaCl_2 .

20. Studies on the Turnover of Phosphorus in Some Tissues with the Use of Radioactive Phosphorus P^{32} .*

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Radiophosphorus P^{32} in the form of phosphate ($\text{Na}_2\text{HPO}_4 + \text{NaH}_2\text{PO}_4$) solution (pH 7.3-7.4) was injected into male mice subcutaneously, and the content and specific activity of P^{32} in the live tissue was examined. The radiophosphorus with the activity of 0.5-5.0 μc was injected to each mouse weighing about 20 grams. The animals were divided into four groups; (a) control, (b) with the experimental liver damage, (c) with methionine treated, and (d) with liver damage and methionine treatment (Table 1). The liver damage was done by the subcutaneous injection of carbon tetrachloride 24 hours before the P^{32} injection. The methionine treatment was performed by the subcutaneous injection of 40 mg l-methionine to each mouse simultaneous with P^{32} administration. The animals were sacrificed three and five hours respectively after the P^{32} administration, and P^{32} content of the acid soluble, the lipid, and the residual fraction of the liver homogenate was measured by the G-M counter. The radiosphorus content of various fractions was as follows (Table 1).

Table 1.

Animals	(a)		(b)		(c)		(d)	
Time after admin.	3	5	3	5	3	5	3	5
Acid soluble fr.	3.70%	2.81	4.23	4.57	4.32	2.41	2.91	3.02
Lipid fraction	0.77**	0.92	1.22	1.45	0.72	0.88	0.36	1.13
Residual fraction	0.91	1.21	0.91	0.45	1.67	0.43	1.06	0.73

** percent of the administration

The radiophosphate content of the lipid and the acid soluble fraction of the damaged liver amounted to higher value than that of the control liver.

The radiophosphorus with the activity of 25 μc per kilo body weight was injected into rabbit. The animal was sacrificed five hours thereafter, and the distribution of P^{32} in adenosine-triphosphoric acid of muscle tissues of this animal was examined. It was found that the bulk of the radiophosphorus was contained in the endstanding acid soluble phosphate groups, and that the acid stable adenylic acid-P fraction comprised only a very small quantity of the isotopes.

* The radioisotopes used were those distributed from the A. E. C. of U. S. A.

21. Rate of Excretion of Radioactive Calcium Ca^{45} * into the Bile and in Urine

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The radioactive calcium in the form of CaCl_2 solution (pH 5.5) was injected intravenously to the rabbits with the experimental bile fistula, and thereafter the excretion of Ca^{45} for four hours into the bile and in urine was examined. The dose for each animal had the activity of 30 μc , and contained 4 mg calcium as the carrier. Calcium determination was done by a modified Kramer-Tisdall method, and the activity of Ca^{45} was measured by G-M counter.

The bile was collected and examined every one hour. The biliary excretion as well as the specific activity of the biliary Ca^{45} was the highest at the first one hour and then decreased gradually. The intravenous injection of 200 mg inactive CaCl_2 at one hour after the Ca^{45} administration caused some variation of the course of the biliary calcium excretion, but the successive decrease of the specific activity of the biliary Ca^{45} proceeded thereby in the same manner as that in control animal (Table 1).