

389. *Periodic Acid and Periodates. Part IV. The Reactions of Disodium Paraperiodate with Soluble Salts of Zinc and Metals of the Alkaline Earths.*

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RAMMELSBERG (*Ann. Physik*, 1868, **134**, 368; 1869, **137**, 305) and Langlois (*Ann. Chim. Phys.*, 1852, **34**, 257) investigated a series of periodates prepared by the reaction of soluble metallic salts with sodium periodate. Rammelsberg's zinc salt had the composition $5\text{ZnO}\cdot 2\text{I}_2\text{O}_7\cdot 14\text{H}_2\text{O}$, and he also prepared a barium salt, $\text{Ba}_2\text{I}_2\text{O}_9$, and a calcium salt, $\text{Ca}(\text{IO}_4)_2$; Langlois isolated $\text{Ca}_2\text{I}_2\text{O}_9$ with 7 or $9\text{H}_2\text{O}$, by a different method, and also a strontium salt, $\text{Sr}_2\text{I}_2\text{O}_9$. We have been unable to obtain any of these salts.

In all cases it was necessary to boil an excess of a concentrated solution of the metal salt with solid disodium paraperiodate, since the solubility of the latter is very small and a precipitate of the salt produced by interaction could not be obtained in the cold. The precipitates were dried at 85° , the metal was determined gravimetrically (zinc as oxide, and calcium and barium as sulphates), and iodine by the modified Kimmins method (see Part I; this vol., p. 1086). The oxygen values were determined as described in Part I.

In this way we prepared the salts $4\text{ZnO}\cdot \text{I}_2\text{O}_7\cdot 5\text{H}_2\text{O}$ and $2\text{CaO}\cdot \text{I}_2\text{O}_7\cdot 4\text{H}_2\text{O}$, which are of reproducible and constant composition and show a crystalline structure under the microscope. No definite strontium compound was produced, the composition of the product being different in different samples (see analyses). The composition of the barium salt, although reproducible, did not correspond with a simple formula, but with $2\cdot 3\text{BaO}\cdot \text{I}_2\text{O}_7\cdot 3\text{H}_2\text{O}$.

Zinc salt ($4\text{ZnO}\cdot \text{I}_2\text{O}_7\cdot 5\text{H}_2\text{O}$ requires I, 32·49; Zn, 33·47; available O,* 14·32%).

Sample.	A.	B.	C.	D.	Mean.
I, %	33·52	33·55	33·54	33·79	33·60
Zn, %	34·45	34·42	34·04	34·77	34·42
O, %	14·01	14·05	13·80	—	13·95

Calcium salt ($2\text{CaO}\cdot \text{I}_2\text{O}_7\cdot 4\text{H}_2\text{O}$ requires I, 46·18; Ca, 14·54; available O, 20·03%).

Sample.	A.	B.	C.	Mean.
I, %	46·60	46·01	46·32	46·31
Ca, %	15·23	15·13	15·44	15·26
O, %	19·88	20·01	20·03	19·97

* For each salt, I_2O_7 is assumed to give $3\frac{1}{2}\text{O}_2$ on decomposition.

Barium salt ($2\cdot3\text{BaO}, \text{I}_2\text{O}_7, 3\text{H}_2\text{O}$ requires I, 32·86; Ba, 40·89; available O, 14·46%).

Sample.	A.	B.	C.	Mean.
I, %	33·13	32·86	33·54	33·17
Ba, %	41·50	41·00	40·23	40·90
O, %	13·72	14·05	13·74	13·83

Strontium salt.

Sample.	A.	B.	C.	D.	E.
I, %	33·58	37·19; 36·56	32·29	31·90; 31·94	32·60
Sr, %	32·35	29·35; 29·38	30·52	33·62; 32·92	33·83
O, %	10·65	14·40	14·01	—	—

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