

In conclusion, however, it may be stated that aqueous solutions of nickel and cobalt salts of dibasic organic acids offer greater resistance to the passage of the electric current than solutions of similar salts of the other metals investigated, notably magnesium, and that this resistance is exceptionally great in the case of the tartrates and malates of nickel and cobalt. This abnormal behavior of the last-named salts is also confirmed by the results obtained with the freezing-point method for determining molecular weights.

WESTERN RESERVE UNIVERSITY,
CLEVELAND, O., June, 1902.

[CONTRIBUTION FROM THE HAVEMEYER LABORATORIES, COLUMBIA UNIVERSITY, No. 69.]

ON THE MANGANESE FERROCYANIDES.

BY ALBERT ERNEST DICKIE.

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THIS work was undertaken to throw further light on the composition of the manganese ferrocyanides as seemed warranted by the discrepancies in the results obtained previously by Wyruboff,¹ Stone and Van Ingen,² and Miller and Mathews.³

Wyruboff, by precipitating a manganous salt with potassium ferrocyanide, obtained a compound to which he ascribes the formula $5\text{Mn}_2\text{Fe}(\text{CN})_6 \cdot 4\text{K}_4\text{Fe}(\text{CN})_6 \cdot 4\text{H}_2\text{O}$, and by using hydroferrocyanic acid he obtained the normal manganese ferrocyanide $\text{Mn}_2\text{Fe}(\text{CN})_6 \cdot 7\text{H}_2\text{O}$. In either case he found it to be immaterial which reagent was used in excess.

Stone and Van Ingen obtained results expressed in atomic ratios as follows:

	Mn.	Fe.
In neutral solution, excess ferrocyanide.....	93	: 100
“ “ “ “ manganese	95	: 100
“ “ “ “ “ hot	92	: 100
“ faintly acid solution, excess manganese.....	101	: 100
“ more “ “ “ “	133	: 100
“ “ “ “ “ hot.....	107	: 100

¹ *Ann. chim. phys.*, [5], 8, 474.

² *This Journal*, 19, 542.

³ *Ibid.*, p. 547.

Miller and Mathews obtained in slightly acid solution :

With excess of ferrocyanide 105 to 108 : 100
 " " " manganese 110 to 111 : 100

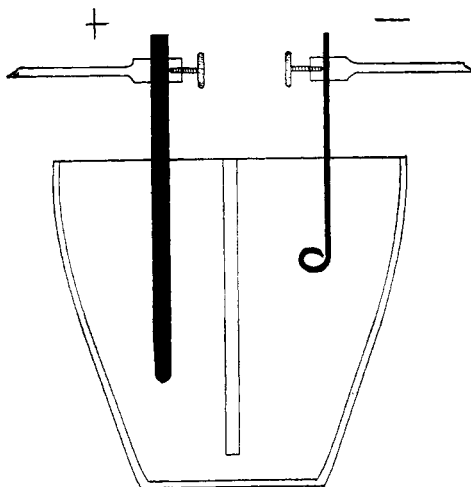
In the new series of experiments we have obtained :

	Ferrocyanide in excess.		Manganese in excess.	
	Mn.	Fe.	Mn.	Fe.
In neutral solution.....	103	: 100	107 to 108	: 100
In acid solution 10 cc. hydrochloric acid (1.20) per liter.....	106	: 100	107 to 110	: 100
In acid solution 10 cc. acetic acid (50 per cent.) per liter	101 to 102	: 100	107	: 100
In presence of ammonia and ammonium chloride	decomposed		no test for potassium	

From the above comparative statements of results the reader is left to draw his own conclusions.

NOTES.

Note on the Preparation of Metallic Lithium.—The following method is a modification of that of Bunsen and Matthiessen for



the electrolysis of fused lithium chloride, and will be found to give good results.