LETTER

On the New Method for Increasing the Sensitivity in Polarographic Analysis. The Use of Rotating Current Alternator

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Previously, the authors reported the use of rotating current alternator for the differential polarographic technique.[1]

In this paper, the authors report the method for increasing the sensitivity in the ordinary polarography using the same apparatus. Fig. 1 shows the scheme of the circuit. As seen in this figure, the voltage of E is applied to the cell and the reduction current flows through the galvanometer. The next instant when the alternating switch is half rotated, the circuit is shorted through the galvanometer and the oxidation current due to the dissolution of the

(1) M. Ishibashi and T. Fujinaga, This Bulletin, **23**, 261 (1950).

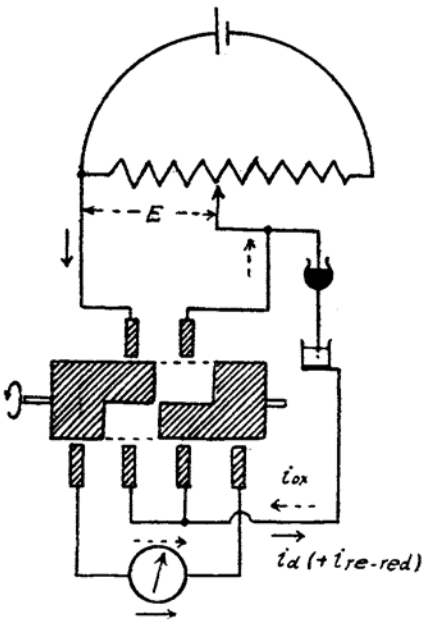

Fig. 1.

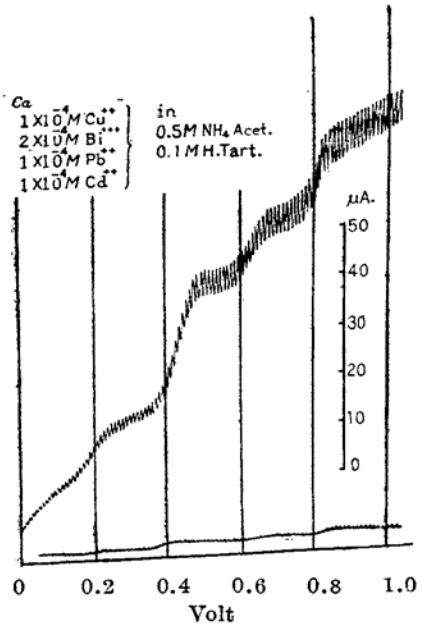

Fig. 2.

depositted metal flows additively through the galvanometer and moreover in the next half rotation, the dissolved ion is reduced again together with the diffused ion. So concentration of the ion occurs on the electrode surface instead of the diffusion layer. The total current is practically *ca.* twenty times greater than the ordinary diffusion current (hundreds microamperes per millimolar ion). By this method, the change of the concentration of the solution before and after the electrolysis is thought to be smaller than that in the ordinary method in spite of the larger current. Fig. 2 shows the polarogram taken with the switch rotated (the new method) and that, taken with the switch stopped (the ordinary polarogram) using the galvanometer of the same sensitivity. Some other intersteing characteristics and the circuits using this rotating switch will be submitted later.

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