— Abstracts of Papers —

The following 36 abstracts are the first part out of 73 papers read at the lecture meeting on 10th and 11th November 1949.

1. Electron Bombardment Conductivity of BaO+SrO.

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It has been expected that impurity level of BaO+SrO lies 1.4 e. v. below the bottom of conduction band, from the theremionic data, by assuming that the impurity states are partially occupied.

In order to verify this directly we observed the resistance change of BaO+SrO by electron bombardment and found that the trough occurred at about 1.55 e. v.

Results:- 1. Plotting the resistance against the accelerating voltage, we found the trough as follows:

Incident beam. (μA.)	Trough (Volt.)
0.5	0.8
1.0	1.0
2.0	1.35
5.0	1.5
>5.0	1.65

2. The trough becomes deeper in compliance with increasing incident current.

Discussion:- 1. Kinetie energy of incident electron, when the trough occurs, is

$$E=E_0+(V-ir_A-ir+\psi_1)-(\psi_2-E_h)$$

where

V: reading of the voltage meter, i: incident current, r_A: μ-ammeter resistance, ψ_1: work function of oxide. -1.7 e. v. ψ_2: work function of Th-W. -3.0 e. v. $2E_h$: heating voltage of emitter, E_0: kinetic energy just outside the cathode and is given as

$$i=\frac{4\pi\, em^* kT}{h^3}\int_{E_0}^{\infty} e^{-(\varepsilon_x-\varepsilon')/kT}\, d\varepsilon_x$$

when $i=5\mu$A, $V=1.5$ e. v. $\therefore E\fallingdotseq 1.55\pm 0.5$ e. v.

2. We think that the trough depends on the increase of free electrones excited to the conduction band from the impurity level by the kinetic energy of incident electron.