

## Theory of Capacity Phenomena Displayed at Mercury Capillary Electrodes [Current Science]

Putting  $\theta = \frac{1}{2}$  in equation (3), we get

$$K_3 c e^{-\frac{K_2 V^*}{kT}} = 1$$

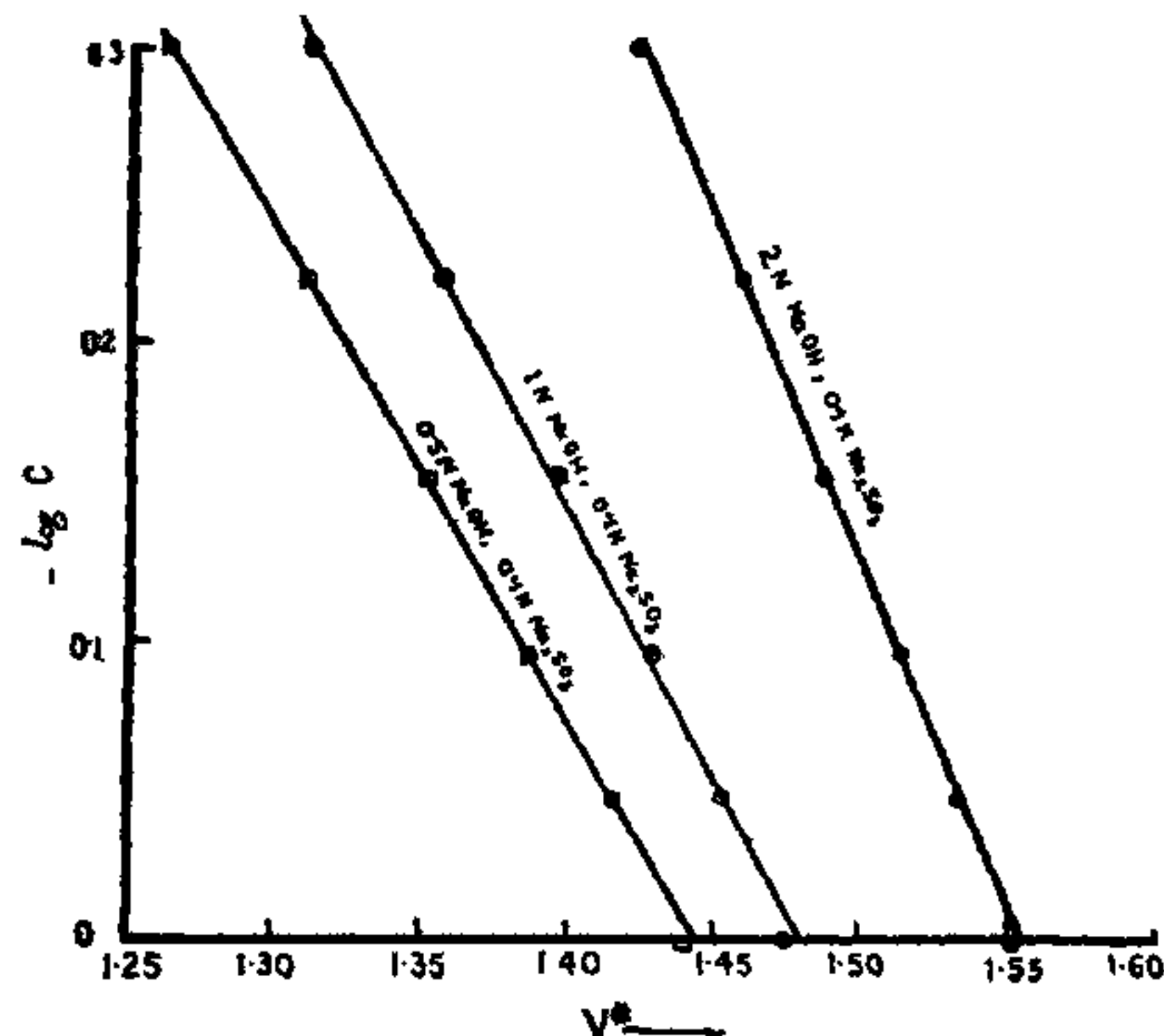


FIG. 1

where  $V^*$  is the potential corresponding to the inflection in the polarographic curve.

$$\text{Therefore, } V^* = \frac{kT}{K_2} \log K_3 + \frac{kT}{K_2} \log c. \quad (5)$$

This shows that  $V^*$  should be a rectilinear function of  $\log c$ . Fig. 1 gives the curves plotted on the basis of the data of Heyrovsky and co-workers.<sup>1</sup> An examination of the curves shows a satisfactory rectilinear relationship, as predicted by the above formulation.

Though this formulation is primarily for condenser current, it can also apply to the shift of the half-wave potentials of reactions hindered by the adsorbed pyridine, as for example the shift of the second wave of the polarographic reduction of oxygen.

1. Heyrovsky and others, *Czechoslovak Chemical Communications*, 1947, **12**, Nos. 1-2.
2. Knobloch, E., (*Czech*) *Chem. listy.*, 1945, **39**, 54-60.
3. Glasstone, Laidler and Eyring, *The Theory of Rate Processes*, McGraw-Hill, 1941.

### HINDUSTAN TRAINER-2

THE first step towards self-sufficiency in aviation, may be said to have been achieved recently when HT-2, the first Indian designed and built prototype aircraft, carried out its flight trials successfully.

The HT-2 is an all-metal, monoplane of 2,100 lb. gross weight, powered by a Gipsy Major 10 Engine of 145 rated horse power. Many special features have been incorporated in the design and construction of this aircraft which makes it superior to similar type of foreign aircraft in the market. The aircraft is all metal including the control surfaces, which reduces the maintenance cost in operation in varying Indian climatic condi-

tions. Secondly, the controls are operated by "push pull rods" instead of cables, thereby eliminating any lag and delay in the operation of controls. The aircraft is fully aerobatic, unrestricted for the total gross weight which is a feature very few trainer aircraft possess.

Except for the engine and the instruments, all the major components of this prototype are designed and manufactured at Hindustan Aircraft Factory. The design team was headed by Dr. V. M. Ghatage, Chief Designer of the factory, assisted by a few foreign-trained Indian aeronautical engineers and a group of engineers from the Indian Institute of Science.

### SINDRI FERTILIZER FACTORY

SINDRI FERTILIZER FACTORY, which will start functioning in September, has a production target of 350,000 tons a year. This annual target is expected to be reached during 1953.

The factory has been planned in such a way that the outturn can be doubled by the installation of additional equipment. Alternately, it can also be expanded to produce different types of products such as nitric acid for India's chemical industry in general, ammonium nitrate or nitro-chalk as fertilizers, etc.

An experiment successfully carried out at Sindri regarding water supply is worth mentioning. This is the construction of an infiltration gallery to extract sub-surface water

running below the sands in the bed of the Damodar river during the hot season when the surface flow dries up. Tests have already proved that the infiltration gallery can yield between five and six million gallons of water a day.

Another feature of interest is that in the process of manufacture of 1,000 tons of ammonium sulphate per day, about 900 tons of calcium carbonate sludge are expected to be thrown up as a by-product. Plans are under the consideration of the Government of India for utilising this by-product as a raw material for a cement factory with an installed capacity of 300 tons per day of first class Portland cement.