Answer on Question #55629, Physics / Other

In an experiment to determine the relationship between the current I through a piece of tungsten wire and the potential difference V across it, the theoretical relationship used was $I=kV^n$, where k and n are constants which may be obtained from a straight line graph of the form y = mx + c, the symbols having their usual meaning. The value of k can then be experimentally determined from ------

A. the slope of the graph of logI plotted on the vertical axis against logV plotted on the horizontal axis

B. the intercept on the vertical axis of the graph of logI plotted on the vertical axis against logV plotted on the horizontal axis

C. the slope of the graph of I plotted on the vertical axis against V^2 plotted on the horizontal axis

D. the intercept on the horizontal axis of the graph of I plotted on the vertical axis against V^2 plotted on the horizontal axis

Solution:

The corresponding linear equation for this experiment is

$$logI = nlogV + logk.$$

From a straight line graph of the form



we can obtained that the value of k can then be experimentally determined from the intercept on the vertical axis of the graph of logI plotted on the vertical axis against logV plotted on the horizontal axis.



Answer: B. the intercept on the vertical axis of the graph of logI plotted on the vertical axis against logV plotted on the horizontal axis

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