On the Effect of a High Frequency Oscillating Field upon the Electrical Resistance of Selenium and Tellurium

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LX. *On the Effect of a High Frequency Oscillating Field upon the Electrical Resistance of Selenium and Tellurium.*
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[Abstract.]

A PIECE of selenium, exposed to the action of the field produced between two insulated metal plates attached to the secondary terminals of a Tesla coil, has its electrical resistance increased. A specimen whose original resistance is low (of the order 100 to 1000 ohms), on exposure to a strong field or to the actual passing of a spark from one of the plates, is immediately and permanently converted into one of high resistance (of the order megohms).

When in this condition or if the original resistance of the specimen is high, the effect of the field is to notably increase the resistance, but it may again be lowered by exposure to light or by alternate heating and cooling.

The effect of a rise of temperature appears to be two-fold: the conductivity of a piece of low resistance is decreased while that of a piece of high resistance is increased.

The effect of the oscillating spark upon a piece of tellurium is to temporarily decrease its electrical resistance.

A rise of temperature produces a large decrease of electrical resistance, but repeated heating and cooling permanently increases the resistance of the specimen. This latter effect depends upon the material employed for the electrodes. It is much greater with copper than with platinum electrodes. In the condition of increased resistance, the effect of the spark in producing a temporary fall of resistance is much more marked.