

Resistance vs Temperature



INTRODUCTION

Our team name is “Team Alpha.” We were curious how the resistance in a resistor would change as temperature changed. In theory, resistance decreases as temperature decreases.

When an object is heated up its particles become excited. In resistors, the excited particles make it hard for electrons to flow freely. However, when the resistor’s temperature decreases it “calms down” the particles allowing the electrons to flow more freely.

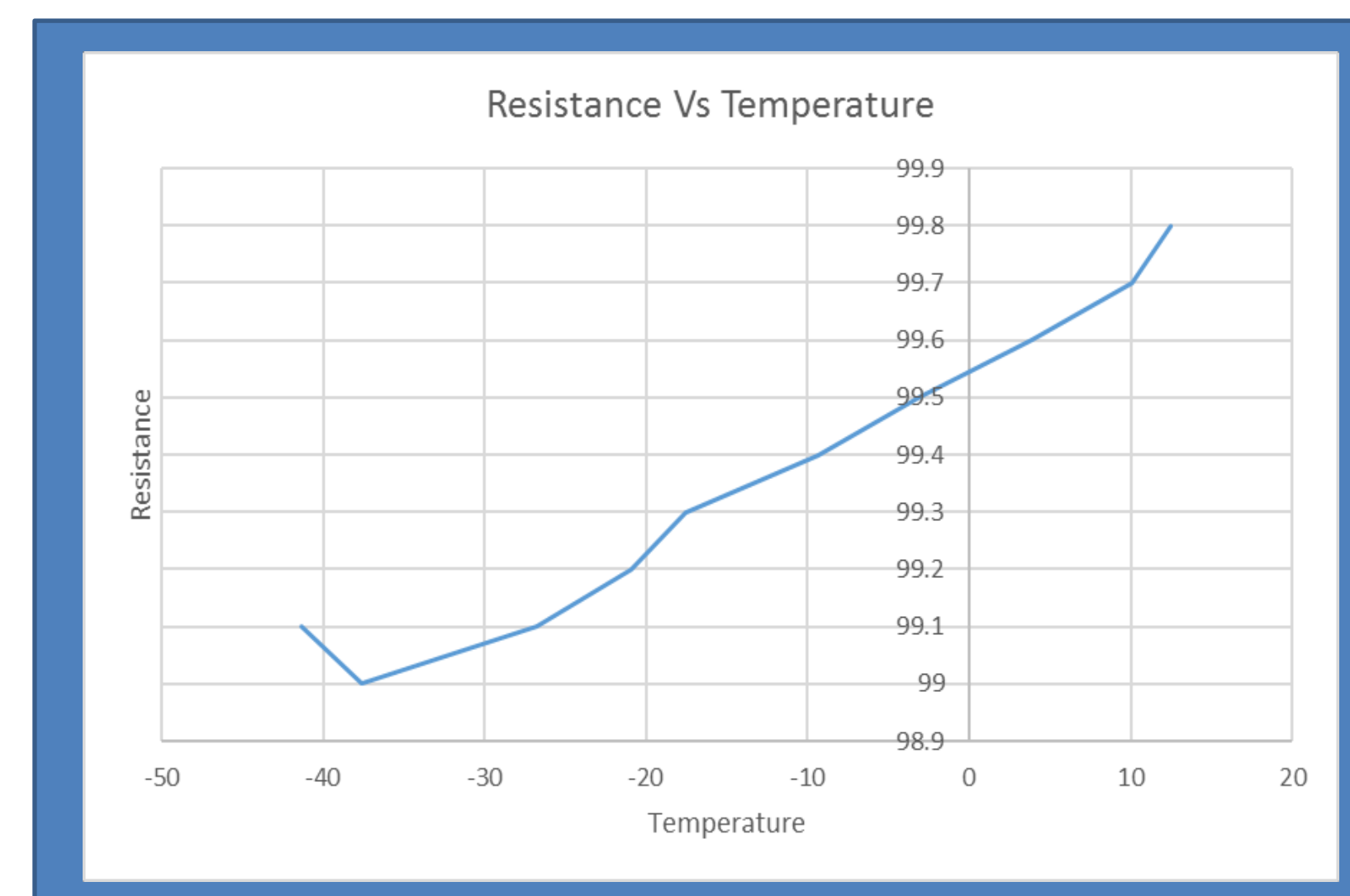
METHOD

Temperature decreases significantly the higher you go in the atmosphere. To record how this temperature change effected a resistor we used a common ohm meter, a device that measures resistance. In our pod we placed the ohm meter with the wires going to the outside of the pod, a camera to record the change in resistance vs time, and a light that would allow the camera to record clear footage of the meter. We then placed a 100 ohm resistor on the outside of the pod exposed to the air.

RESULT

The results from our experiment were quite successful. We recorded clear data from the ohm meter and we compared this data with the time and temperature recorded from a different pod. After comparing data we were able to prove that resistance decreases as temperature decreases.

Although our results were successful, we noticed that the resistance increased slightly at a certain altitude. This confused us at first because we knew that the temperature decreased when altitude increased. We talked amongst ourselves and our professor and concluded that this was the point where the balloon passed through the ozone layer.



The ozone layer of our atmosphere absorbs ultraviolet rays from the sun, causing the layer to have a higher temperature than surrounding air. Although this increase was fairly small, we still found that the increased temperature raised the resistance of our resistor.

CONCLUSIONS

Based on our results, we’ve concluded that resistance decreases as temperature decreases.

Our team was very excited to have set up a successful experiment that proved this theory correct.

