Alpha Range: Analysis of the Range of Alpha Particles in Materials Using a Cloud Chamber

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Alpha particles are all around us, trying to pass through our bodies and destroy the DNA our ancestors worked so hard for. By using a cloud chamber to visualize radiation, I tested different materials to try and find the best material to stop alpha particles by thickness. Of the materials tested, I hypothesized gold would be the best insulator against alpha particles. Four materials were put in front of americium 241, gold, aluminum, paper, and saran wrap. The distances of alpha particles emitted by the source and that passed through a material would be recorded. This data would then be analyzed to find the thickness of each material needed to stop an alpha particle from the source of Am 241. Gold ended up being the best performing material with an average calculated stopping distance of 2.36 μm. In Contrast to aluminum with a stopping distance of 25.04μm, saran wrap with 29.13μm, and paper which was too thick to have any alpha particles pass through it with a thickness of 129.38μm. This experiment showed that denser materials generally are better at blocking alpha particles than less dense materials. Gold had a calculated stopping distance of 2.36 μm, suggesting that a thin film of gold is able to stop alpha particles at 5.5MEV. Further experiments will clarify the drop off rate of alpha particles that pass through materials.

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