ParticiPANts

Cole Bixby, Chris Hartung, Cindy Zheng
1 Department of Physics, University of ... City, State, Zip, USA.
2 JINA-CEE, Michigan State University, East Lansing, MI, 48823, USA.

JINA-CEE

Gamma Spectroscopy: *The day where nothing went wrong*

- Using a NaI gamma spectrometer we identified a "mystery isotope"
- We calibrated the spectroscope channels using the known samples of ^{137}Cs and ^{60}Co
- Using the measured energy value of 820.8 keV and known data values from the NuDat database, we unmasked the mystery isotope to be ^{54}Mn

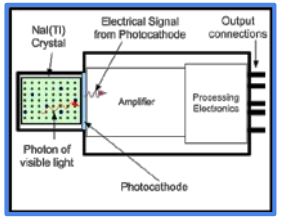
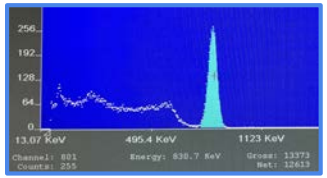


Diagram of NaI gamma spectrometer

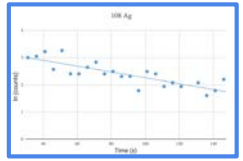


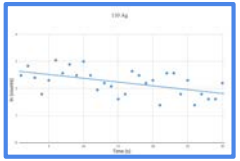
Graph of mystery isotope (^{54}Mn)

- The graph compares channels or energy to the number of counts
- The graph's peak represents the energy released as gamma rays during decay
- The number of peaks equals to the number of ways the isotope decays

Half Life: *The day where the computer hated us*

- Using a Geiger- Muller Tube, we were able to determine the half life of Ag-108 and Ag-110
- A silver coin was bombarded with neutrons in an AMBE source to create the radioactive silver isotopes
- After calibrating the equipment using GM Tube software, we tracked the decay of both isotopes with GM HalfLife
- We found the half-life of ^{108}Ag to be 64.78 sec and the half-life of ^{110}Ag to be 24.76 sec
- Our measurement for ^{108}Ag differed significantly from the expected value, and our measurement for ^{110}Ag was very close to the expected value.

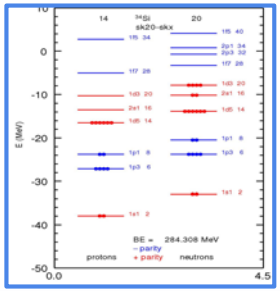




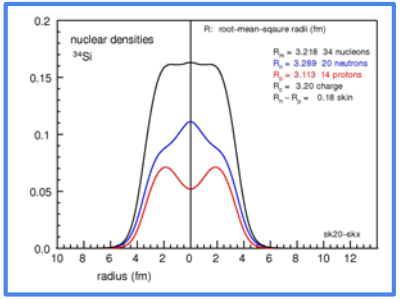
Group Photo!

The Geiger-Muller Tube setup

Nuclear Theory: *The day with homework*



- Using a program created by Professor Alex Brown, we investigated EDF Theory by computing predictions using the theory and comparing the values to known results
- We learned how to analyze these graphs to determine whether various isotopes had magic numbers of protons or neutrons



This material is based upon work supported by the National Science Foundation under Grant No. PHY-1430152 (JINA Center for the Evolution of the Elements).