

Decay Study of ^{33}Mg and ^{35}Mg for Level Scheme Development

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An experiment was conducted at TRIUMF laboratory using the GRIFFIN spectrometer to study the decay of ^{35}Mg and ^{33}Mg . Isotopes in their decay chains include $^{35,34}\text{Al}$, $^{35,34}\text{Si}$, and $^{35,34}\text{P}$ for ^{35}Mg and $^{33,32}\text{Al}$, $^{33,32}\text{Si}$, and ^{33}P for ^{33}Mg . These can be populated via beta decay, beta-delayed neutron emission, and possibly beta-delayed two-neutron emission (which we unfortunately didn't see for ^{35}Mg or ^{33}Mg ; too little data). Analysis was done on the full data set, including tagging with a new OGS detector to cleanly separate out the beta-delayed neutron emission daughters. By setting up a gamma-gamma coincidence spectrum, with the coincidence gating being within 300 nanoseconds, new energy level transitions for certain isotopes down the decay chain can be discovered. Through this method, in the case of ^{35}Mg , new energy levels and transitions for both ^{35}Al and ^{35}P were discovered. This presentation is to show our summer work experience leading up to our discoveries and the fruit it bore.