

Names: _____

PHYS 7501, FS 2017

Group Activity 1

Due: In class, August 29th

1. Which of the following reactions are possible without non-standard model physics?
For invalid reactions, indicate what the issue is.
 - a. $^{137}\text{Cs} \rightarrow ^{137\text{m}}\text{Ba} + e^-$
 - b. $^{12}\text{C}(\alpha, \gamma)^{16}\text{O}$
 - c. $^{144}\text{Sm}(\gamma, \alpha)^{140}\text{Nd}$
 - d. $^{126}\text{Te}(n, \gamma)^{127}\text{I}$
2. Smoke detectors work by monitoring the current generated from ^{241}Am α decay.
When this material finally stops undergoing radioactive decay, what will it mostly become?
Write the dominant decay sequence.
3. What is the element with the highest-mass stable nuclide with $N=Z$?
4. What is the element with the highest-mass stable nuclide with $Z>N$?
5. ^{11}Li has an rms radius of 3.5fm. What mass-number A would you predict from this radius given the empirical formula for matter radii? What rms radius would you predict for $A=11$?