82. The lines that lead toward the lower left are alpha decays, involving an atomic number change of $\Delta Z_\alpha = -2$ and a mass number change of $\Delta A_\alpha = -4$. The short horizontal lines toward the right are beta decays (involving electrons, not positrons) in which case A stays the same but the change in atomic number is $\Delta Z_\beta = +1$. Fig. 43-16 shows three alpha decays and two beta decays; thus,

$$Z_f = Z_i + 3\Delta Z_\alpha + 2\Delta Z_\beta \qquad \text{and} \qquad A_f = A_i + 3\Delta A_\alpha \quad .$$

Referring to Appendix F or G, we find $Z_i = 93$ for Neptunium, so $Z_f = 93 + 3(-2) + 2(1) = 89$, which indicates the element Actinium. We are given $A_i = 237$, so $A_f = 237 + 3(-4) = 225$. Therefore, the final isotope is ^{225}Ac.