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Quiz 6

1)

$$A_{Co60} = \lambda_{Co60} * N_{Co60}$$

$$A_{Co60} = \left(\frac{\ln(2)}{t_{\frac{1}{2}}}\right) * N_{Co60}$$

To find the atomic mass of Co60, we add the disintegration energy to the atomic mass of Ni60

$$N_{Co60} = 59.930785\ amu + \left(2.8231\ MeV * \frac{1\ amu}{931.5\ MeV}\right) = 59.9338157\ amu$$

$$A_{Co60} = \left(\frac{\ln(2)}{5.271\ years}\right) * \left(\frac{1g}{59.9338157\frac{g}{mol}} * N_A\right) = \frac{1.32129e21\ decays}{year}$$

Setting this equal to A_Sr90

$$A_{Sr90} = \frac{1.32129e21\ decays}{year} = \left(\frac{\ln(2)}{t_{\frac{1}{2}}}\right) * N_{Sr90}$$

$$A_{Sr90} = \left(\frac{\ln(2)}{28.8\ years}\right) * (Mass_{Sr90}/M_{Sr90} * N_A)$$

$$Mass_{Sr90} = \frac{A_{Sr90} * 28.8\ years * M_{Sr90}}{\ln(2) * N_A}$$

Finding the M of Sr90 with disintegration energy from Zr90 -> Y90

$$M_{Sr90} = 89.904704\ amu + \left((2.280\ MeV + .546\ MeV) * \frac{1\ amu}{931.5\ MeV}\right) = 89.90773782\ amu$$

$$Mass_{Sr90} = \frac{1.32133e21\ decays}{year} * \frac{28.8\ years * 89.90773782\frac{g}{mol}}{\ln(2) * N_A} = 8.1964\ g\ Sr90$$

2) The pace is alright so far, but it might be a little annoying having to do a cp alongside a weekly homework.

3) Not that comes to mind.

4) Not so far.

5) Not right now.