Date _____ Period _____ Name _____

CHAPTER 30

# Reinforcement

## Decay and Half-life

One of the ways scientists estimate the age of rocks, meteorites, and even moon rocks is to look at the ratio of uranium to lead in the rocks. As the uranium decays, it disappears at a fixed rate, and scientists know the half-life of the uranium and all the intermediates it forms so they can estimate the age of rocks. The less uranium remaining in the rock, the older the rock is. The lead that is formed in the process is not radioactive and does not decay any further.

In the space below, write the complete decay series for uranium-238 to lead-206. It goes through 14 steps of $\alpha$ and $\beta$ decay, which are listed below. For the $\beta$ decay steps, leave out the antineutrinos to simplify the process.

$$\text{U-238} \rightarrow \alpha \rightarrow \beta \rightarrow \beta \rightarrow \alpha \rightarrow \alpha \rightarrow \alpha \rightarrow \alpha \rightarrow \alpha \rightarrow \beta \rightarrow \beta \rightarrow \alpha \rightarrow \beta \rightarrow \beta \rightarrow \alpha$$