Answers to selected questions

Chapter 19

Q6. Chlorine found in nature consists primarily of two isotopes, chlorine-35 and chlorine 37, which have different masses. The atomic mass of 35.5 determined from chemical measurements is a weighted average of the masses of these two isotopes.

Q12. No. Different radioactive isotopes decay at widely different rates characterized by their half-lives. The half-life can be a fraction of a second for one isotope or thousands of years for another.

Q18. No. Uranium-235 is much more fissionable than uranium-238, although uranium-238 will occasionally undergo fission. Uranium-235 makes up less than 1% of the uranium found in uranium ores.

Q24. No. When the reactor goes subcritical, less than one new fission occurs for each earlier fission reaction. This causes the overall rate of reaction in the reactor to slow down.

Q30. No. Research and development efforts are continuing in an attempt to produce useful energy from fusion reactions. The goal of developing a commercially feasible fusion reactor has not yet been met.