

Name \_\_\_\_\_

### HALF-LIFE WORKSHEET

\*\*\*Use Reference Table N of the N. Y.S. Chemistry Regents Reference Tables to assist you in answering the following questions.

- 1 How long does it take a 100.00g sample of Au-198 to decay to 6.25g?
2. How many half-lives will pass by the time a 60.0g sample of Co-60 decays to 7.5g?
3. How long does it take a 180g sample of Au-198 to decay to 1/8 its original mass?
4. What fraction of a sample of N-16 remains undecayed after 42.78 seconds?
5. What is the half-life of a radioactive isotope if a 500.0g sample decays to 62.5g in 24.3 hours?
6. How old is a bone if it presently contains 0.3125g of C-14, but it was estimated to have originally contained 80.000g of C-14?
7. If you are injected with 1.0000 mg of Tc-99, how long will it take for the sample to decay to 1/64 of its original mass?
8. What is the half-life of a radioactive isotope if it takes 6.2 days for a 72g sample to decay to 18g?
9. Cs-137 is produced as a waste product in nuclear fission reactors. What fraction remains undecayed after 241.60 years?
10. How many half-lives of K-37 will pass after 6.15 seconds?
11. What fraction of Pu-239 (an artificially produced isotope used as a fuel in some nuclear fission reactors) remains undecayed after 219,600 years?
12. If a 700.00g sample of I-131 decays to 43.75g, how much time has passed?
13. How long will it take a 3.5g sample of Fr-220 to decay so that only 1/4 of the original amount of Fr-220 remains?
14. What is the half-life of a radioisotope if 1/16 of it remains undecayed after 26.4 days?
15. H-3 (tritium) is an artificially produced radioisotope used in some nuclear reactions. How much of a 1.000 kg sample remains undecayed after 86.17 years?
16. If a radioactive sample of a pure material decays from 600g to 75g in 42.84 days, what radioisotope could be in the sample?

17. Co-60 is used in some cancer radiation therapies. What fraction of a sample of Co-60 will remain undecayed after 5.271 years?

18. Sr-90 is a common waste product of nuclear fission reactors. How many half-lives of Sr-90 will pass after 145.5 years?

19. How many years would it take for a 1.000g sample of U-238 to decay to about 3.9 mg?

20. If your cellar was measured to contain 2.400g of Rn-222 (a radioactive gas naturally produced by some granite deposits), how long would it take for that sample to decay to 0.1 5g?

21. U-233 & U-235 are the only two isotopes of Uranium used as fuels in nuclear fission reactors. If you had 2.500 kg samples of each, which one would contain the least amount of the original radioisotope after 1 billion years?

22. Which isotope on Reference Table N is would be least likely to show a measurable amount of decay within your life time?

23. What is the half-life of a radioactive isotope if 1/32 of it remains undecayed after 7.5 days?

24. If 13.125g of K-42 remains undecayed after 61.80 hours, what was the original sample size?