

Atomic Structure/Nuclear Chemistry

Extra Practice

- How many protons are found in an atom of each of the following?
 - boron
 - sulfur
 - neon
 - lithium
- How many electrons are found in an atom of each of the following?
 - potassium
 - argon
 - silver
 - tungsten
- How many neutrons are found in an atom of each of the following?
 - oxygen
 - gold
 - antimony
 - calcium
- For manganese, what is the:
 - # p^+
 - # e^-
 - # n^0
 - atomic #
 - mass #
- For sodium, what is the:
 - # p^+
 - # e^-
 - # n^0
 - atomic #
 - mass #
- For bromine, what is the:
 - # p^+
 - # e^-
 - # n^0
 - atomic #
 - mass #
- For fluorine, what is the:
 - # p^+
 - # e^-
 - # n^0
 - atomic #
 - mass #
- For beryllium, what is the:
 - # p^+
 - # e^-
 - # n^0
 - atomic #
 - mass #
- For zinc, what is the:
 - # p^+
 - # e^-
 - # n^0
 - atomic #
 - mass #
- For iron, what is the:
 - # p^+
 - # e^-
 - # n^0
 - atomic #
 - mass #

Nuclear Reactions:

- Radon-226 undergoes alpha decay. Write out the complete nuclear reaction for this.
- Magnesium-22 undergoes beta decay. Write out the complete nuclear reaction for this.

13. Krypton-81 undergoes beta decay. Write out the complete nuclear reaction for this.
14. Write out the nuclear reaction for the alpha decay of uranium-238.
15. Gold-195 undergoes beta decay. Write out the complete nuclear equation for this.
16. Complete the following: ${}_{90}^{232}\text{Th} \rightarrow {}_{91}^{232}\text{Pa} + {}_Z^AX$
17. Complete the following: ${}_{88}^{224}\text{Ra} \rightarrow {}_{86}^{220}\text{Rn} + {}_Z^AX$
18. Complete the following: ${}_{53}^{121}\text{I} \rightarrow {}_{-1}^0\beta + {}_Z^AX$
19. Complete the following: ${}_Z^AX \rightarrow {}_{-1}^0\beta + {}_{16}^{32}\text{S}$
20. Complete the following: ${}_{77}^{174}\text{Ir} \rightarrow {}_{75}^{170}\text{Re} + {}_Z^AX$
21. Radium-226 undergoes α decay. The product of this reaction undergoes α decay. What is the product of the second decay reaction?

Half Life Problems:

22. If the half-life for the radioactive decay of zirconium-84 is 26 minutes and you start with a 175 gram sample, how much will be left over after 104 minutes?
23. How much of a 200. gram sample of Au-198 is left after 8.10 days if the half-life is 2.70 days?
24. How many milligrams remain of a 25.0 mg sample of radium-226 after 9 594 years? The half-life of radium-226 is 1 599 years.
25. The half-life of plutonium-239 is 24 110 years. Of an original mass of 150. g, how much remains after 120 550 years?
26. The half-life of Zn-71 is 2.4 minutes. If you had 100.0 g at the beginning, how many grams would be left after 7.2 minutes has elapsed?
27. How much time will be required for a three fourths of a H-3 sample to decay? The half-life of H-3 is 12.26 years.
28. Iodine-131 has a half-life of 8.040 days. If you start with a 40.0 mg sample, how much will remain after 24.0 days?
29. The half-life of iodine-125 is 60 days. What fraction of iodine-125 nuclides would be left after 360 days?
30. Carbon-14 has a half-life of 5730 years. How much of a 144.0 g sample of carbon-14 will remain after 17 190 years?