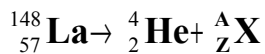
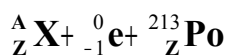
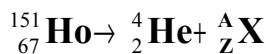
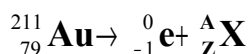
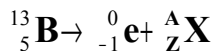
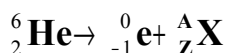
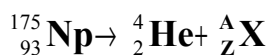
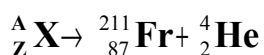
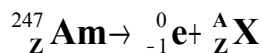
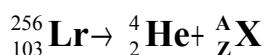


Nuclear Chemistry Worksheet-

Show "K-U-E-S" where necessary, otherwise answer completely. Work that does not fit in the provided space needs to be completed on your own paper.

Part A: Completing Nuclear Decay Reactions: 1-10

For each of the atoms listed below, complete the decay reaction by solving for ${}^A_Z\text{X}$ or other missing information. Remember that the mass and protons on each side of the arrow need to equal each other.



Part B: Writing Nuclear Decay Reactions:

Write equations for the following nuclear decay reactions. Make sure that both mass numbers and atomic numbers are balanced on each side

11. Decay of polonium-218 by alpha (α) emission.

12. Decay of carbon-14 by beta (β^-) emission.

13. The alpha decay of radon-198

14. The beta (β^-) decay of uranium-237

Nuclear Chemistry Worksheet-

Show "K-U-E-S" where necessary, otherwise answer completely. Work that does not fit in the provided space needs to be completed on your own paper.

Part C: Half-Life:

15. If 100.0 g of carbon-14 decays until only 25.0 g of carbon is left after 11 460 years, what is the half-life of carbon-14?

$$\begin{aligned}n \text{ (number of half-lives)} &= 2 \text{ half-lives} \\t_{1/2} \text{ (half-life of carbon-14)} &= 5730 \text{ yr}\end{aligned}$$

16. Thallium-208 has a half-life of 3.053 min. How long will it take for 120.0g to decay to 7.50 g?

$$\begin{aligned}n \text{ (number of half-lives)} &= 4 \text{ half-lives} \\t_T \text{ (total time)} &= 12.21 \text{ min}\end{aligned}$$

17. Gold-198 has a half-life of 2.7 days. How much of a 96g sample of gold-198 will be left after 8.1 days?

$$\begin{aligned}n \text{ (number of half-lives)} &= 3 \text{ half-lives} \\m_r \text{ (mass remaining)} &= 1/8 \\m_f \text{ (final mass)} &= 12\text{g}\end{aligned}$$

Part D: Process & Applications of Nuclear Energy:

18. What is the difference between nuclear fusion and nuclear fission?

19. Name three uses for nuclear reactions

20. Describe 2 uses of radioactive tracers.