= m_f **2**n (n=# of half-lives) Try #1 - #5 without using the equation: 1. Tritium (H-3) is a radioactive isotope of hydrogen with a half-life of 12.3 years. How long would it take for a 40.0 g sample to decay down to 1.25 g? Ans: 2. Fe-61 has a half-life of 6.00 min. Of a 100.0 mg sample, how much will remain after 18.0 min? Ans: 3. After 20.0 days, a 120 kg sample of Bi-210 decays down to just 7.5 kg. What is its half-life? Ans: 4. What percent of a sample of a radioactive element whose halflife = 5.0 years will decay after 25 years? Ans: 5. K-42 has a half-life of 12.0 hours. At present, a given ore sample contains 34.2 mg of K-42. How much did it contain yesterday at this same time? Ans: For the remaining 6 problems, use the half-life equations (above) to solve: (look up halflife on periodic table) 6. Tritium is hydrogen-3. Of a 24.0 mg sample, how much will remain after 9.25 years? Ans: 7. How long will it take for a 80.0 g sample of cobalt-60 to decay down to 13.0 g? Ans: 8. After 34.8 min, a 43.5 g sample of Fr-215 has decayed down to 10.0 g. Whatis its half-life? Ans: 9. An ore sample is found to contain 6.78 g of K-40. How much did it contain 6.0 billion years ago? Ans: _____ 10. How long will it take for one mole of Na-22 to decay down to just one atom? (hint-initial amount = 6.02×10^{23}) Ans: 11. What percent of a tritium sample will decay in one year? (see #1) Ans:

175 205 Ans (IRO+3): 5 16.4 29.9 61.5 89.1 93.5 96.9 137 162 5.5 12.5 13.8 14.2 Units (IRO): min min years years years days mg mg mg g g % %

 $T = (t_{1/2})(n)$

WS 5.4 Radioactive Half-Life

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show all work!