

# Half Life and Radioactive Decay

Name: \_\_\_\_\_

**Instructions:** The *half-life* of a radioactive substance is a characteristic constant. It measures the time it takes for a given amount of the substance to become reduced by half as a consequence of decay, and therefore, the emission of radiation. Scientists use half-life to calculate amount of radioactive isotopes present in a sample.

**Sample Half-life Problem:** A 100 gram sample of carbon-14 undergoes radioactive decay until 12.5 grams of carbon-14 remains in the original sample. This process took 17,190 years. How many half-lives have passed? What is the half-life of  $^{14}\text{C}$ ?

**Step 1:** Make a data table with the original isotope, half-lives and time passed as the column headers.

Isotope (grams)	Number of Half-Lives Passed	Time Passed (years)
100g	0	0
50	1	
25	2	
12.5	3	17,190

**Step 2:** Using the half-life principle, deduct the correct amount of isotope and record the number of half-lives passed until you reach the given number of years.

Amount of Isotope (g)	Number of Half-Lives Passed	Time Passed (years)
100g	0	

**Step 3:** Divide the number of year passed by the number of half-lives passed:  $17,190/3 = 5730$  years in one half-life. Fill in the remainder of the chart.

Amount of Isotope (g)	Number of Half-Lives Passed	Time Passed (years)
100g	0	0
50	1	5,730
25	2	11,460
12.5	3	17,190

**Half-life Problems:**

1. What is the half-life of  $^{238}\text{Pu}$  if a 500g sample decays to 62.5 grams in 63 hours?
2. How much of a 100 g sample of  $^{14}\text{C}$  would remain after 37 years if the half-life is 1.2 35 years?
3. The half-life of  $^{238}\text{Pu}$  is  $1.4 \times 10^8$  years. If there were 0.25 g of the sample left after  $2.8 \times 10^8$  years, how many grams were in the original sample?
4. The half-life of iodine-131 is 8.04 days. How long will it take a 100 g sample to decay into 6.25g?

# Radioactive Decay And Half Life Worksheet Answers

**Peipei Pang**



## Radioactive Decay And Half Life Worksheet Answers:

**Chemistry** Carson-Dellosa Publishing,2015-03-16 Chemistry for grades 9 to 12 is designed to aid in the review and practice of chemistry topics Chemistry covers topics such as metrics and measurements matter atomic structure bonds compounds chemical equations molarity and acids and bases The book includes realistic diagrams and engaging activities to support practice in all areas of chemistry The 100 Series science books span grades 5 to 12 The activities in each book reinforce essential science skill practice in the areas of life science physical science and earth science The books include engaging grade appropriate activities and clear thumbnail answer keys Each book has 128 pages and 100 pages or more of reproducible content to help students review and reinforce essential skills in individual science topics The series will be aligned to current science standards Addison-Wesley Science Insights ,1996 *Science Spectrum* Holt Rinehart & Winston,Holt, Rinehart and Winston Staff,2003-03 **Nuclear Energy** ,1985 **Prentice Hall Science Explorer** Michael J. Padilla,2002 Radiologic Science for Technologists Stewart C. Bushong,1997 The purpose of this textbook is to convey a working knowledge of radiologic physics and to prepare radiography students for the certification exam by the ARRT The textbook also provides a standard of knowledge from which practicing radiographers can make decisions about technical factors and diagnostic image quality in the work place This edition gives an expanded coverage of quality management which includes all of the content on the ARRT It also includes coverage of new cardiovascular interventional equipment and recent advances in spiral CT and digital radiography Keeps students informed and up to date with respect to professional standards and requirements *Prentice Hall Physical Science Concepts in Action Program Planner National Chemistry Physics Earth Science* ,2003-11 Prentice Hall Physical Science Concepts in Action helps students make the important connection between the science they read and what they experience every day Relevant content lively explorations and a wealth of hands on activities take students understanding of science beyond the page and into the world around them Now includes even more technology tools and activities to support differentiated instruction **Laboratory Manual in Physical Geology** American Geological Institute,1997 This Laboratory Manual in Physical Geology is a richly illustrated user friendly laboratory manual for teaching introductory geology and geoscience *Ate Science Plus 2002 LV Red* Holt Rinehart & Winston,2001-02 *Holt Science and Technology 2002* Holt Rinehart & Winston,Holt, Rinehart and Winston Staff,2002 **Te HS&T J** Holt Rinehart & Winston,Holt, Rinehart and Winston Staff,2004-02 **Physics, International Adaptation** John D. Cutnell,Kenneth W. Johnson,David Young,Shane Stadler,2022-09-07 The newly revised Twelfth Edition of Cutnell s Physics delivers an effective and accessible introduction to college and university physics It contains easy to follow explanations of critical math and problem solving concepts From kinematics to work and energy temperature heat electricity magnetism and optics as well as foundational concepts in more advanced subjects like special relativity Physics is the ideal introductory text for students from any background The greatest strength of the text is the synergistic relationship it develops between

problem solving and conceptual understanding The book lays emphasis on building relevance of physics in day to day living and highlights the physics principles that come into play A wide range of applications that are biomedical in nature and others that deal with modern technology Holt Chemistry Ralph Thomas Myers,2004 *Biology* Holt Rinehart & Winston,Holt, Rinehart and Winston Staff,2004 Holt Science and Technology Holt Rinehart & Winston,2004-02

*Radiologic Science* Stewart C. Bushong,1984 **Jacaranda Nature of Biology 2 VCE Units 3 and 4, LearnON and Print** Judith Kinnear,Marjory Martin,Lucy Cassar,Elise Meehan,Ritu Tyagi,2021-10-29 Jacaranda Nature of Biology Victoria s most trusted VCE Biology online and print resource The Jacaranda Nature of Biology series has been rewritten for the VCE Biology Study Design 2022 2026 and offers a complete and balanced learning experience that prepares students for success in their assessments by building deep understanding in both Key Knowledge and Key Science Skills Prepare students for all forms of assessment Preparing students for both the SACs and exam with access to 1000s of past VCAA exam questions now in print and learnON new teacher only and practice SACs for every Area of Study and much more Videos by experienced teachers Students can hear another voice and perspective with 100s of new videos where expert VCE Biology teachers unpack concepts VCAA exam questions and sample problems For students of all ability levels All students can understand deeply and succeed in VCE with content mapped to Key Knowledge and Key Science Skills careful scaffolding and contemporary case studies that provide a real word context eLogbook and eWorkbook Free resources to support learning eWorkbook and the increased requirement for practical investigations eLogbook which includes over 80 practical investigations with teacher advice and risk assessments For teachers learnON includes additional teacher resources such as quarantined questions and answers curriculum grids and work programs Te HS&T a Holt Rinehart & Winston,Holt, Rinehart and Winston Staff,2004-02 Chemistry Homework Frank Schaffer Publications,Joan DiStasio,1996-03 Includes the periodic table writing formulas balancing equations stoichiometry problems and more **Te HS&T 2007 Shrt Crs M** Holt Rinehart & Winston,2007

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