

Decay Lab

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1 Objective

In Decay's lab objective, it tends to educate and give out an opportunity to understand not only theoretically but also acknowledge the relation between half life of the decay and initial input of the product.

2 Definition of Nuclear Decay

Nuclear Decay in physics mean, as I've researched, it's a process in which the nucleus of an unstable atom loses energy by emitting radiation, including alpha particles, beta particles, gamma rays and conversion electrons. These are all the particles that are able to emit radiation since they're radioactive.

3 Methods

As Dr. Schultz had created an application called Java, it did potentially help us to find the half-life and decay rate.

4 Hypothesis

As we initially have the equation for nuclear decay,

$$A = A_0 \times e^{-\lambda t}$$

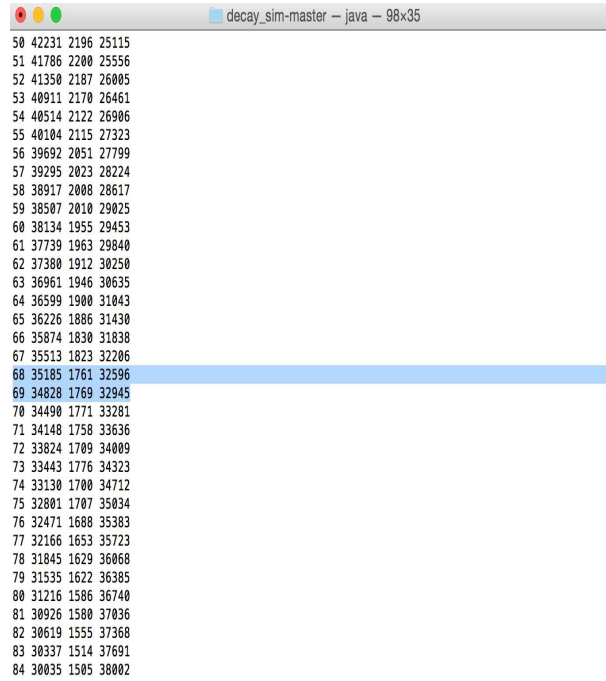
We can now derive into half-life equation:

$$\frac{A}{A_0} = \frac{1}{2} = e^{-\frac{T}{2}}$$

$$\ln \frac{1}{2} = -\lambda \times \frac{T}{2}$$

$$\frac{t}{2} = \frac{\ln 2}{\lambda}$$

5 Example for calculation



50	42231	2196	25115
51	41786	2200	25556
52	41350	2187	26005
53	40911	2170	26461
54	40514	2122	26906
55	40104	2115	27323
56	39692	2051	27799
57	39295	2023	28224
58	38917	2008	28617
59	38507	2010	29025
60	38134	1955	29453
61	37739	1963	29840
62	37380	1912	30250
63	36961	1946	30635
64	36599	1900	31043
65	36226	1886	31430
66	35874	1830	31838
67	35513	1823	32206
68	35185	1761	32596
69	34828	1769	32945
70	34490	1771	33281
71	34148	1758	33636
72	33824	1709	34009
73	33443	1776	34323
74	33130	1700	34712
75	32801	1707	35034
76	32471	1688	35383
77	32166	1653	35723
78	31845	1629	36068
79	31535	1622	36385
80	31216	1586	36740
81	30926	1580	37036
82	30619	1555	37368
83	30337	1514	37691
84	30035	1505	38002

Figure 1: Image

6 Conclusion

In this experiment, we have acknowledged a reverse relation between decay rate and its half-life because it does show in "Example for Calculation" that the larger the decay rate the smaller the half-life would be. Furthermore, another feature that we can find through this experiment is the initial input would not matter toward its value.