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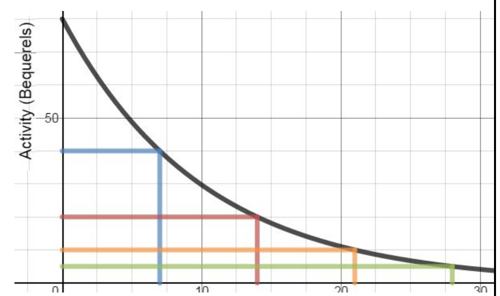
| Nuclear physics | Alpha decay equation | | In an alpha-decay, an alpha particle ( ${}^{4}_{2}He$ ) is emitted. The original nucleus experiences a decrease in proton number of 2 and a decrease in mass number of 4. | An example would be ${}^{44}_{20}Ca \rightarrow {}^{40}_{18}Ar + {}^{4}_{2}He$ . Note how the proton and mass numbers are conserved during the decay. |
| Nuclear physics | Beta decay equation | | In a beta decay, a neutron converts itself into a proton and an electron. The proton stays put inside the nucleus while the ejected electron is called a beta particle.<br><br>The nucleus experiences an increase of proton number by one, while the mass number stays the same (11p + 13n becoming 12p + 12n – still 24 nucleons in total). The notation for the electron is ${}^{0}_{-1}\beta$ . | An example would be ${}^{24}_{11}Na \rightarrow {}^{24}_{12}Mg + {}^{0}_{-1}\beta$ . Note how the proton and mass numbers are conserved during the decay. |
| Nuclear physics | Decay curve | | Finding half-life of an isotope from a decay curve | The half-life of a radioactive isotope is the time taken for the activity of a radioactive sample to decay to half the original value. Nuclear decays follow a constant half-life pattern -- in this graph the half-life can be determined to be 7 seconds.   |