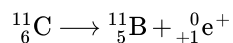


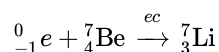
19.7: Further Modes of Decay - Positron Emission and Electron Capture

Isotopes produced by [nuclear reactions](#), which do not occur in nature (artificial isotopes) are invariably unstable and [radioactive](#). They exhibit two kinds of decay not found among [naturally occurring radioactive elements](#). The first is **positron emission** in which a fundamental particle we have not discussed is ejected from the nucleus. The **positron** is identical with the electron except that it has a positive rather than a negative charge. Its symbol is ${}^0_{+1}e^{+}$ or ${}^0_{+1}\beta^{+}$. An example of a positron emission reaction is the decay of ${}^{11}_6\text{C}$



Positron emission is common among isotopes having a low neutron-to-proton ratio.

The second new method of decay is called **electron capture**. The nucleus absorbs one of the electrons from its own innermost core. An example is the following reaction:



Again this results in an increased neutron/proton ratio.

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