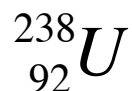


CHEMISTRY POSITRON DECAY AND ELECTRON CAPTURE PRACTICE

WRITING POSITRON DECAY AND ELECTRON CAPTURE EQUATIONS

You need to know how to write and understand nuclear symbols:



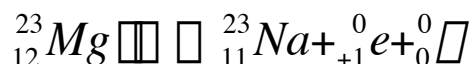
Remember that the lower number is the atomic number and the upper number is the mass number.

Positron Decay

Positron decay is like a mirror image of beta decay. These points present a simplified view of what positron decay actually is:

- 1) Something inside the nucleus of an atom breaks down, which causes a proton to become a neutron.
- 2) It emits a positron and a neutrino which go zooming off into space.
- 3) The atomic number goes DOWN by one and mass number remains unchanged.

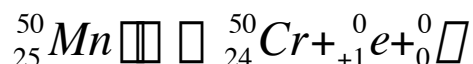
Here is an example of a positron decay equation:



Some points to be made about the equation:

- 1) The nuclide that decays is the one on the left-hand side of the equation.
- 2) The order of the nuclides on the right-hand side can be in any order.
- 3) The way it is written above is the usual way.
- 4) The mass number and atomic number of the neutrino are zero.
- 5) The neutrino symbol is the Greek letter "nu."

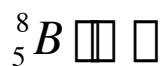
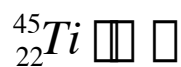
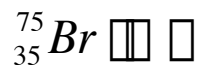
Here is another example of a positron decay equation:



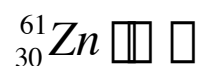
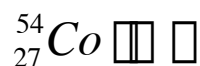
Notice that all the atomic numbers on both sides ADD UP TO THE SAME VALUE and the same for the mass numbers.

PRACTICE

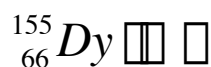
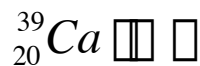
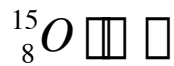
Here's your first set of exercises. Write out the full positron decay equation.



Here are five more to try:



And here are five more:



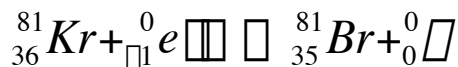
CHEMISTRY POSITRON DECAY AND ELECTRON CAPTURE PRACTICE

ELECTRON CAPTURE

Electron capture is not like any other decay - alpha, beta, or positron. All other decays shoot something out of the nucleus. In electron capture, something ENTERS the nucleus. These points present a simplified view of what electron capture is:

- 1) An electron from the closest energy level falls into the nucleus, which causes a proton to become a neutron.
- 2) A neutrino is emitted from the nucleus.
- 3) Another electron falls into the empty energy level and so on causing a cascade of electrons falling. One free electron, moving about in space, falls into the outermost empty level. (Incidentally, this cascade of electrons falling creates a characteristic cascade of lines, mostly (I think) in the X-ray portion of the spectrum. This is the fingerprint of electron capture.)
- 4) The atomic number goes DOWN by one and mass number remains unchanged.

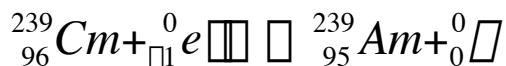
Here is an example of a electron capture equation:



Some points to be made about the equation:

- 1) The nuclide that decays is the one on the left-hand side of the equation.
- 2) The electron must also be written on the left-hand side.
- 3) A neutrino is involved, It is ejected from the nucleus where the electron reacts, so it is written on the right-hand side. 3) The way it is written above is the usual way.

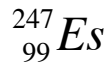
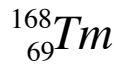
Here is another example of a electron capture equation:



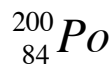
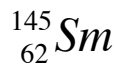
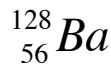
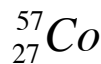
Notice that all the atomic numbers on both sides ADD UP TO THE SAME VALUE and the same for the mass numbers.

PRACTICE

Here's your first set of exercises. Write out the full electron capture equation. Then click the link to see the answers.



Here are five more to try:



And here are five more:

