

Nuclear Chemistry Worksheet

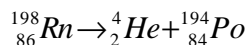
Using your knowledge of nuclear chemistry, write the equations for the following processes:

- 1) The alpha decay of radon-198
- 2) The beta decay of uranium-237
- 3) Positron emission from silicon-26
- 4) Sodium-22 undergoes electron capture
- 5) What is the difference between nuclear fusion and nuclear fission?
- 6) What is a "mass defect" and why is it important?
- 7) Name three uses for nuclear reactions.

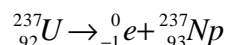
Nuclear Chemistry Worksheet – Solutions

Using your knowledge of nuclear chemistry, write the equations for the following processes:

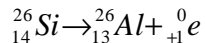
- 1) The alpha decay of radon-198



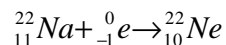
- 2) The beta decay of uranium-237



- 3) Positron emission from silicon-26



- 4) Sodium-22 undergoes electron capture



- 5) What is the difference between nuclear fusion and nuclear fission?

In nuclear fusion, small nuclei are combined to form a larger nucleus – this process releases a very large amount of energy, and is the main source of energy in the sun. In nuclear fission, large nuclei break apart to form smaller ones, releasing a large amount of energy. Fission is used in nuclear power plants to generate energy.

- 6) What is a “mass defect” and why is it important?

“Mass defect” refers to the difference between the mass of the nucleons (protons + neutrons) in a nucleus when weighed separately and the mass of the nucleus when it’s put together. This difference is important because this missing mass is converted to energy using $E=mc^2$ that’s used to hold the nucleus together.

- 7) Name three uses for nuclear reactions.

- **Nuclear weapons**
- **Medicine**
- **Nuclear power generation**