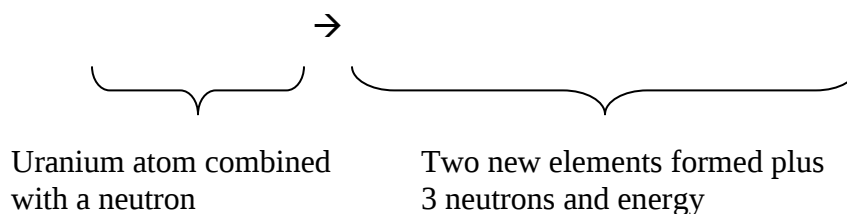


NUCLEAR REACTIONS

Nuclear Fission

- Nuclear reaction in which the _____ of a massive atom is split into _____ smaller nuclei, subatomic _____ and _____
- Results in the production of a large amount of energy
 - Example: fission of 1 g of uranium-235 = energy from burning ____ tonnes of coal
- Advantage
 - Allows the use of a _____ amount of nuclear material to produce _____ amounts of electricity
- Disadvantage
 - Results in the production of _____ with a long half-life
 - Waste materials must be _____
 - Life span of nuclear reactors is approximately _____ years
- Fission reactions can be induced (caused to occur) by bombarding certain atoms with _____

Nuclear Fission of Uranium



- Rules:
 - The sum of the atomic mass on each side must _____
 - The sum of the charges must _____ (count _____)
- This is the reaction used in the Canadian-built CANDU (Canadian Deuterium Uranium) reactors

Chain Reactions

- The above reaction was started by a _____ hitting a stable atom of _____ to create an unstable uranium _____
- Note that on the products side are three new _____ → these _____ are free to collide with three other uranium atoms to create three new fission reactions each of which will result in 3 more _____
- Chain Reaction → self-driving reaction
- This reaction is slowed down using a _____
- If the reaction gets out of control, it results in a _____ → the reaction produces so much energy that it literally destroys the power plant and releases all of the radioactive waste material into the environment

See Chernobyl attachment

Nuclear Fusion

- Nuclear fusion is the process of combining _____ nuclei into _____ more massive nucleus
- Process that drives solar reactions in our Sun


 Hydrogen-2 and Hydrogen-3
 isotopes

- Advantages of Fusion vs. Fission
 - Produces approximately _____ times the amount of energy per equivalent mass of starting material
 - Product is _____, a _____ material
- Disadvantages
 - Need extreme _____ and _____ (10 million Kelvin in sun = _____ Kelvin on Earth due to less _____)

- Have no way to contain the energy and heat from a nuclear fusion reaction
- Only way to start a fusion reaction at present is with a _____ reaction
(ex: _____ bomb)

Homework Radioactivity (BC Science 10 SWB pg. 140)
 Comparing Nuclear Fission & Fusion (BC Science SWB pg. 141)
 Nuclear Fission & Fusion Reactions (BC Science 10 SWB pg. 142)

Quiz Nuclear Reactions