

## Chapter J

# Nuclear Physics

### J1 Nuclear Equations

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Complete the nuclear equations. Don't forget the neutrino / antineutrino if it is a beta decay!

J1.1  ${}_{95}^{241}\text{Am} \rightarrow {}_{?}^{?}\text{Np} + ?$  Alpha decay

J1.2  ${}_{1}^3\text{H} \rightarrow {}_{?}^{?}\text{He} + ?$  Beta- decay

J1.3 (a)  ${}_{6}^{14}\text{C} \rightarrow {}_{?}^{?}\text{N} + ?$  Beta- decay (b)  ${}_{6}^{11}\text{C} \rightarrow {}_{?}^{?}\text{B} + ?$  Beta+ decay

J1.4  ${}_{27}^{60}\text{Co}^* \rightarrow {}_{?}^{?}\text{Co} + ?$  Gamma decay

J1.5  ${}_{1}^3\text{H} + {}_{1}^2\text{H} \rightarrow {}_{?}^{?}\text{He} + {}_{?}^{?}\text{n}$  Nuclear fusion

J1.6  ${}_{38}^{90}\text{Sr} \rightarrow {}_{?}^{?}\text{Y} + ?$  Beta- decay

J1.7  ${}_{92}^{238}\text{U} \rightarrow {}_{?}^{?}\text{Th} + ?$  Alpha decay

J1.8  ${}_{92}^{235}\text{U} + {}_{0}^1\text{n} \rightarrow {}_{57}^{147}\text{La} + {}_{?}^{87}\text{Br} + ?{}_{?}^{?}\text{n}$  Nuclear fission

J1.9  ${}_{13}^{23}\text{Al} \rightarrow {}_{?}^{?}\text{Mg} + ?$  Beta+ decay

And as a bonus round, the unattached neutron is unstable too.

J1.10  ${}_{?}^{?}\text{n} \rightarrow ? + ? + ?$  Beta- decay