

Übungen 1

1. Nuclei are defined by the numbers of protons and neutrons. What are isotopes, what are isotones, and what are isobars?
 2. Calculate the binding energy of the oxygen isotope ^{19}O using the mass tables and compare it with the result of the Weizsäcker formula.
 3. The half-life of ^{19}O is 27.1 s, calculate the life time τ of ^{19}O and the decay constant λ . Assume you have 1 μg of ^{19}O , what is the activity of the radioactive material?
 4. Calculate the Q-value of the neutron capture reaction $^{18}\text{O}(n,\gamma)^{19}\text{O}$ on the basis of the Weizsäcker formula and compare the result with the energy given in the mass tables.
-
1. The first excited state in ^{12}C is at 4.4 MeV excitation energy, what is the Q-value of inelastic scattering $^{12}\text{C}(p,p')^{12}\text{C}^*$ and what is the energy of the emitted gamma radiation