

Name: _____ Date: _____ Period: _____

Mass Defect and Binding Energy Worksheet

Directions

Solve the following problems.

Mass of a proton: 1.007276 units

Mass of a neutron: 1.008665 units

1 u = 931 MeV

1. Tritium is an isotope of hydrogen. It is used in the watch industry as a radioluminescent material. It is laid on the dial and hands so that your watch can be read in the dark. The mass of the tritium isotope, ${}^3_1\text{H}$, is 3.0160490 units.

a. What is the mass defect of this isotope? _____

b. What is the binding energy of this isotope? _____

2. The mass of a ${}^{12}_6\text{C}$ nucleus is 12.00000 units.

a. What is the mass defect of this nucleus? _____

b. What is the binding energy of this nucleus? _____

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3. An oxygen isotope, $^{16}_8\text{O}$, has a mass of 15.99491 units.

a. What is the mass defect of this isotope? _____

b. What is the binding energy of this isotope? _____

4. The mass of an iron-56 nucleus is 55.92066 units.

a. What is the mass defect of this nucleus? _____

b. What is the binding energy of the nucleus? _____

5. The binding energy of helium -4 is 28 MeV.

a. What is the mass of a helium nucleus (round to 5 decimal places)? _____