This print-out should have [illegible] questions. Multiple-choice questions may continue on the next column or page – find all choices before answering.

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001 10.0 points

The binding energy of a nucleus is

1. related to the mass lost in a chemical reaction.

2. the energy evolved when a nucleus breaks up into fundamental particles.

3. related to the number of electrons in a nucleus.

4. the energy released when Z protons and N − Z neutrons come together to form a nucleus. **correct**

5. the energy required to eject one neutron from the nucleus.

Explanation:

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002 10.0 points

The nuclear binding energy for lithium-7 is the energy released in the nuclear reaction

1. [illegible]

2. [illegible] **correct**

3. [illegible]

4. [illegible]

5. [illegible]

Explanation:

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003 10.0 points

Calculate the energy change when one [illegible]U nucleus undergoes the fission reaction

$$[illegible]$$

The masses needed are [illegible]

1. [illegible] J

2. [illegible] J **correct**

3. [illegible] J

4. [illegible] J

5. [illegible] J

Explanation:

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004 10.0 points

For the thermonuclear reaction

$$D + T \to {}^4He + n$$

the difference in mass between products and reactants is [illegible] u. What is ΔE per mole of helium?

1. [illegible] kJ

2. [illegible] kJ **correct**

3. [illegible] kJ

4. [illegible] kJ

5. [illegible] kJ

Explanation:

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005 10.0 points

How does a nuclear reaction differ from a chemical reaction?

1. In a chemical reaction elements are created and destroyed while all elements are conserved in a nuclear reaction.

2. In a nuclear reaction the elements change identities; in an ordinary chemical reaction they do not. **correct**

3. Entropy is increased in a nuclear reaction while entropy decreases in a chemical reaction.

4. There is no actual difference in the two reactions. The only difference is that a nuclear