Addressing Misconceptions about Chemical Bonding in the Secondary Classroom

Answer the following two multiple choice questions taken from a questionnaire given by Dr. William C. Galley from McGill University at the beginning of an introductory undergraduate physical chemistry course.1

\_\_\_\_\_\_\_\_ 1) The release of energy (exothermic) during the combustion of ethylene

CH2=CH2(g) + 3O2(g) 🡪 2CO­2(g) + 2H2O(g)

is due to

1. Breaking the C=C bond
2. Breaking the C–H bonds
3. Breaking the O=O bonds
4. All of the above
5. Forming the C=O and O–H bonds

\*\*\*There may be more than one correct answer for multiple-choice question #2.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 2) An O–P in ATP are referred to as a “high-energy phosphate bond” because

1. The bond is a particularly stable bond.
2. The bond is a relatively weak bond
3. Breaking the bond releases a significant quantity of energy
4. A relatively small amount of energy is required to break the bond.

1 Galley, W.C. (2004). Exothermic bond breaking: A persistent misconception. *Journal of Chemical Education, 81* (4), 523-525.

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