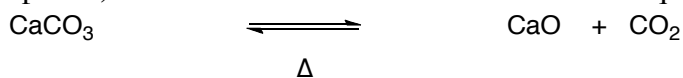
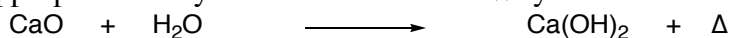


1. (2 points) Which statement about carbon is **not** true?
- a) A carbon atom always has 6 electrons.
  - b) Carbon cannot make more than 4 covalent bonds.
  - c) The geometry around carbon in a stable molecule can be linear, trigonal or planar, tetrahedral.
  - d) A carbon atom can make single, double or triple bonds with another carbon atom.

2. (2 points) Which statement is NOT true about this equilibrium?

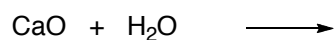
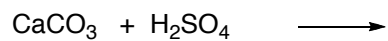
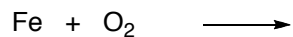


- a) The enthalpy ( $\Delta H$ ) favors the left, because  $\text{CaCO}_3$  is a rock (limestone).
  - b) The entropy ( $\Delta S$ ) favors the right, because there are two products.
  - c) The equilibrium depends on the temperature; lower temperatures favor the products.
  - d) It requires a great deal of heat to make this reaction proceed to products.
3. (4 points) Explain what happens when water is added to cement powder. Why is it inappropriate to say that cement “dries”? Why is heat released?



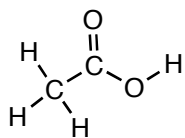
4. (2 points) Draw the electron configuration of a nitrogen (C) atom. Identify the core and valence electrons.

5. (9 points total, 3 points each) Predict the products of each reaction and describe what everyday process each reaction represents.



6. (1 point) The bonding in the structure shown below is best described as:

- a) covalent
- b) ionic
- c) chemical



Extra credit (2 points) What is something related to chemistry that you would like to understand by the end of this semester?