

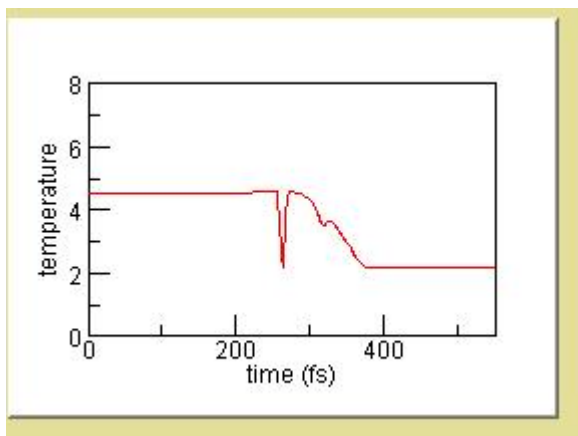
Check One:
 Pretest
 Posttest

Test for **Reaction Rates, Catalysis, and Pasteurization** Activity

Name _____ Teacher _____

Date _____ Class _____

1. Chemical energy is converted into heat energy when bonds form. Based on this information, look at the graph below and determine if the bond for the substance formed or broke.



(Check one)

- a. The bond for the substance formed.
 b. The bond for the substance broke.

Selects B.	1
Selects A	0

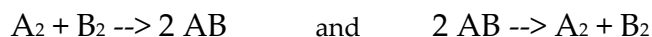
2. List two ways in which you can increase the speed of a chemical reaction.

Explanation Score

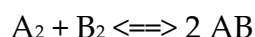
	Response includes...
Complete (2)	Lists two of the following: * Increase the concentration by adding more of a substance; * increase the concentration by making the container in

	which the reaction is occurring smaller; * increase the temperature
Mostly complete (1)	Includes one correct reason from above list
Incorrect (0)	Other

3. The following two reactions can occur:



This can be indicated by using a double arrow in the reaction description.

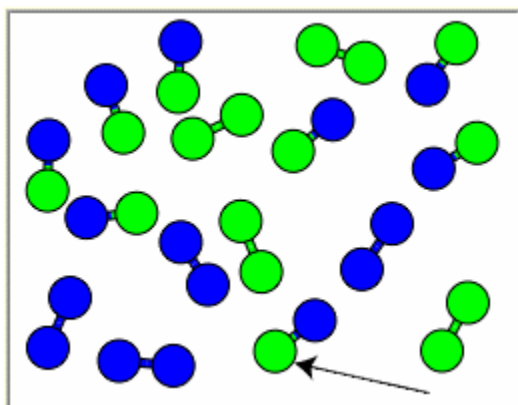


a. At some point the two reactions reach equilibrium. Explain what it means for a chemical reaction to be in equilibrium.

Explanation Score

	Response includes...
Complete (2)	Equilibrium occurs when both reactions happen at the same rate causing the concentration of A_2 , B_2 and AB to remain constant or almost unchanging.
Mostly complete (1)	Equilibrium occurs when concentration is no longer changing. (or there is no change in the reactants and products). Answer does not reference the concept of reactions occurring at the same rate and at the same time.
Incorrect (0)	Other; substance reached equilibrium when reaction stopped and no more products formed.

b. Below is a snapshot of the equilibrium reaction $A_2 + B_2 \rightleftharpoons 2 AB$. This snapshot was taken when the chemical system was in equilibrium. If this system stays in equilibrium, will the atom indicated by the arrow always be bonded to the same atom it is currently bonded to? Explain your answer.



Explanation Score

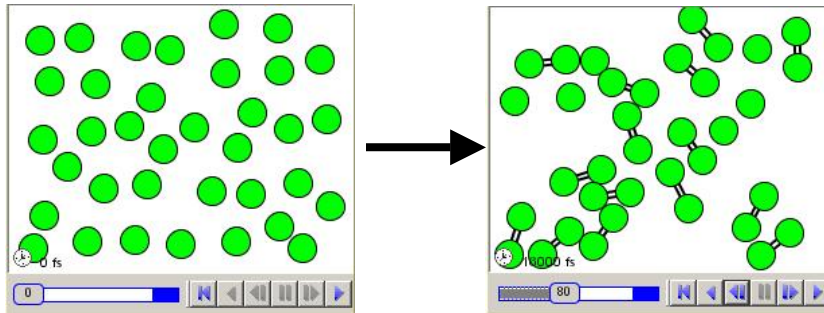
	Response includes...
Complete (2)	Not necessarily, even though the reaction is in equilibrium the molecules are still changing, the green molecule may ended up bonded to another blue molecule or another green molecule even at some period.
Mostly complete (1)	Not necessarily, it could be bonded to another molecule. Answer does not include why this might be true.
Incorrect (0)	Other.

4. In a pasteurization plant a lab technician takes random samples to ensure quality of the milk being delivered. The lab technician found that all samples, as expected, contained a low level of bacteria and the milk flavor was good. However, in the last sample of milk ALL of the bacteria were killed and the milk tasted terrible. What could have happened during the pasteurization process that could explain the result?

Explanation Score

	Response includes...
Complete (2)	The temperature was set too high and the milk was in the pasteurized for a long time. This would account for the lack of bacteria and for the breakdown of the molecules responsible for milk flavor.
Mostly complete (1)	Only included high temperature but not time or vice versa.
Incorrect (0)	Other

5. The picture below on the left shows many atoms that will react by forming a bond. The picture on the right shows the atoms after a short period of time.



The graphs below represent three different reactions that were conducted. Each time a different set of atoms (or substance) was used which would form bonds that were stronger or weaker depending on the type of atom used.

Which graph shows the substance that has the strongest chemical bonds?

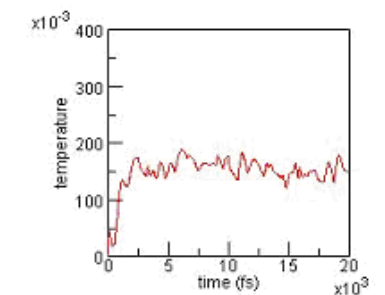
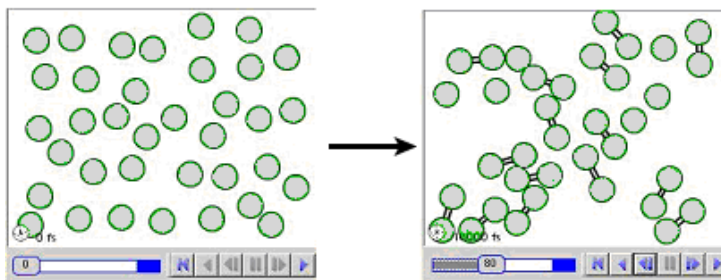
Substance in Graph A

Substance in Graph B

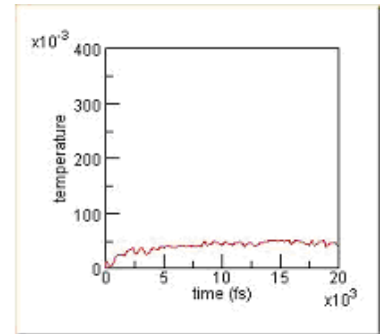
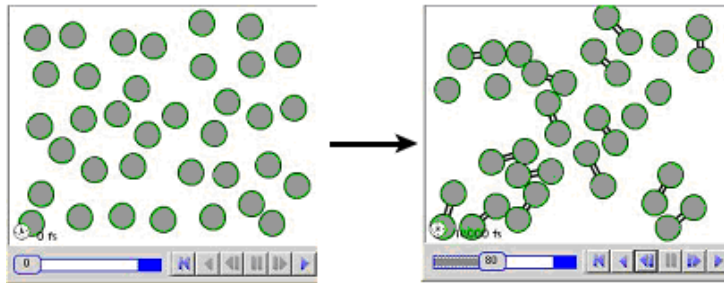
Substance in Graph C

Selects C.	1
Selects another	0

Substance A



Substance B



Substance C

