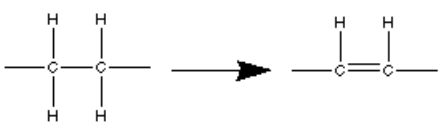
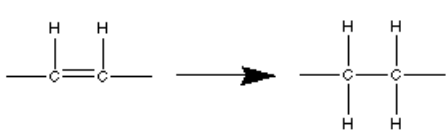
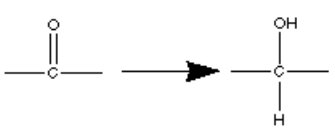
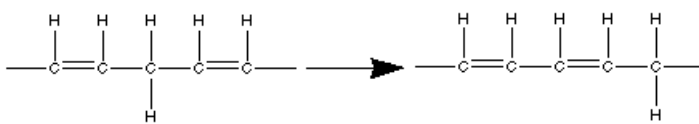


TEST for CHAPTER 3

Question 1. What compounds are generated by heating triacylglycerol with aqueous solution of sodium hydroxide? (There might be one or more correct answers.)

1. fatty acid ethyl ester
2. fatty acid anhydride
3. glycerol
4. fatty acid sodium salt

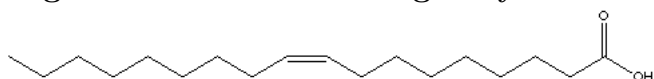
Question 2. Choose the correct reaction that happens during hydrogenation of vegetable oil.

1. 
2. 
3. 
4. 

Question 3. What advantages are expected by hydrogenating vegetable oil? (There might be one or more correct answers.)

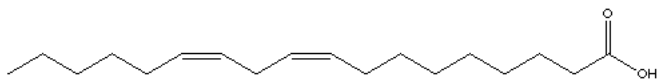
1. The oil becomes stable against oxidation.
2. Consistency of the oil can be controlled.
3. Trans fat content can be increased.

Question 4. Choose the correct fatty acid that will be generated by complete hydrogenation of the following fatty acid.



1. stearic acid
2. palmitic acid
3. linoleic acid
4. myristic acid

Question 5. Choose the fatty acid that will be generated by complete hydrogenation of the following fatty acid.



1. stearic acid
2. palmitic acid
3. linoleic acid
4. myristic acid

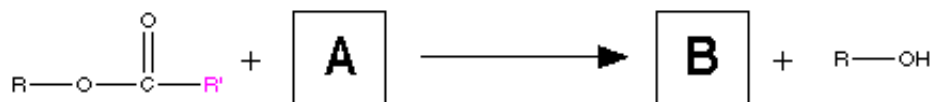
Question 6. Choose the structure that is typical in trans fatty acid.

- 1.
- 2.
- 3.

Question 7. Choose the correct description on trans fat.

1. According to the regulation issued by FDA, selling food that contains *trans* fat is forbidden.
2. According to the regulation issued by FDA, buying food that contains *trans* fat is forbidden.
3. According to the regulation issued by FDA, food manufactures should indicate the content of *trans* fat on their product.
4. According to the regulation issued by FDA, consumers are encouraged to take food containing *trans* fatty acid.

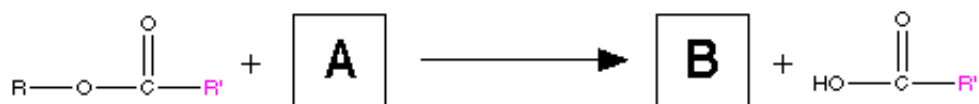
Question 8. The following scheme illustrates alcoholysis reaction, with some of the chemicals missing.



What chemicals in the right are correspondent to the blank A and B? (Choose "N/A" for one of the chemicals that is not applicable.)

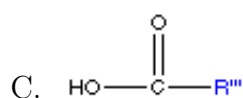
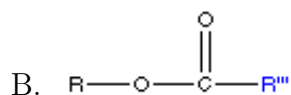
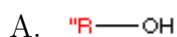
1. blank A
 2. blank B
 3. N/A
- A.
- B.
- C.

Question 9. The following scheme illustrates acidolysis reaction, with some of the chemicals missing.



What chemicals in the right are correspondent to the blank A and B? (Choose N/A for one of the chemicals that is not applicable.)

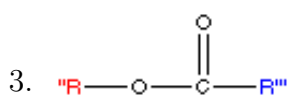
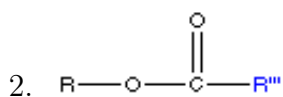
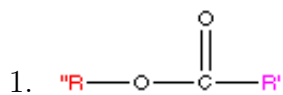
1. blank A
2. blank B
3. N/A



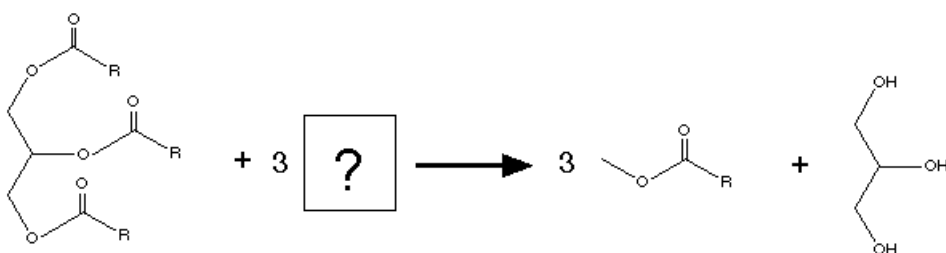
Question 10. The following scheme illustrates interesterification reaction, with one of the reactants missing.



Choose the correct ester structure for the blank.



Question 11. The following scheme illustrates methanolysis reaction, with one of the chemicals missing.

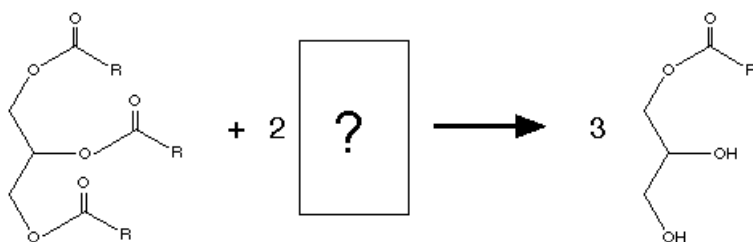


Write the name of the chemical to complete the scheme.

Question 12. Choose the application field of fatty acid methyl esters.

1. food emulsifier
2. medicine for cardiovascular disease
3. alternative fuel for diesel engine
4. soaps

Question 13. The following scheme illustrates glycerolysis reaction, with one of the chemicals missing.



Write the name of the chemical to complete the scheme.

Question 14. Choose the possible application field of monoacylglycerols.

1. alternative fuel for diesel engine
2. food emulsifier
3. medicine for cardiovascular disease
4. soap

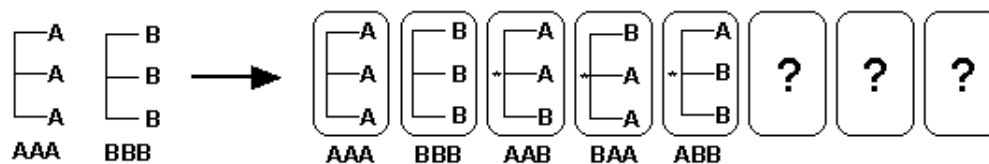
Question 15. What happens by heating triacylglycerol with sodium methoxide at 80 °C?

1. saponification
2. methanolysis
3. transesterification
4. glycerolysis

Question 16. Choose the application fields of transesterification. (There might be one or more correct answers.)

1. production of fatty acid methyl ester as an alternative diesel fuel
2. production of lard with improved physical properties
3. production of a material for *trans* fat-free margarine
4. production of long chain fatty acid vinyl esters for making plastics

Question 17. Interesterification of two mono-acid triacylglycerols gives, in principle, 8 different kinds of molecular species, if all the possible regio- and stereoisomers are taken into consideration. The following scheme illustrates the reaction, with some of the products missing.



Write the three missing triacylglycerol species. Use triplets to indicate the structure. For example, AAA for $\begin{matrix} \text{A} \\ | \\ \text{A} \\ | \\ \text{A} \end{matrix}$, AAB for $\begin{matrix} \text{A} \\ | \\ \text{A} \\ | \\ \text{B} \end{matrix}$, and BAA for $\begin{matrix} \text{B} \\ | \\ \text{A} \\ | \\ \text{A} \end{matrix}$.

Question 18. How many kinds of molecular species of triacylglycerol are generated by interesterification of three mono- acid triacylglycerols shown below?



Taking into consideration all the possible regio- and stereoisomers, answer the number of molecular species.