FATTY ACIDS – TOPIC TEST 1

QUESTION 1
The most likely formula from the list below that could be a fatty acid is:

A. $C_{12}H_{22}O_{11}$
B. $CH_3(CH_2)_{14}CHCHCOOH$
C. $C_4H_8\,NH_2COOH$
D. CH_3COOH

QUESTION 2
A saturated fatty acid would have the formula

A. $C_{17}H_{34}O_2$
B. $C_{16}H_{30}O_2$
C. $C_{17}H_{32}\,COOH$
D. $C_{16}H_{30}COOH$

QUESTION 3
As the hydrocarbon chain of a fatty acid increases in length

A. The melting point decreases
B. The density decreases
C. They become easier to spread
D. They become more solid

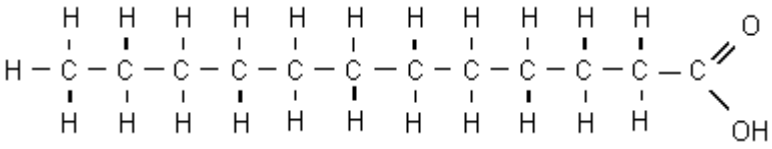
QUESTION 4
$C_{15}H_{31}COOH$ is a saturated fatty acid. If it were to become polyunsaturated, its formula would be

A. $C_{15}H_{25}COOH$
B. $C_{16}H_{32}O_2$
C. $C_{15}H_{29}COOH$
D. $C_{15}H_{30}COOH$

QUESTION 5
Which of the following is a monounsaturated fatty acid?

A. $CH_3CH_2CH_2CH_2CH_2CH_2CH_2CH_2COOH$
B. $CH_3CH_2CHCHCH_2CHCHCH_2COOH$
C. $CH_3CHCHCH_2CH_2CH_2CH_2CH_2COOH$
D. $CH_3CH_2CH_2CH_2CH_2CH_2CH_2CH_2CH_2CH_2COOH$

QUESTION 6
Circle and name the functional group(s) on the fatty acid below.



QUESTION 7
Use the diagrams below to answer the following questions.

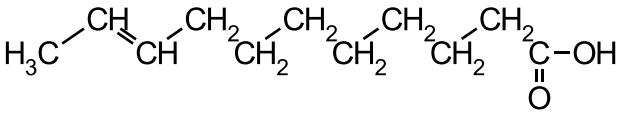


Diagram A

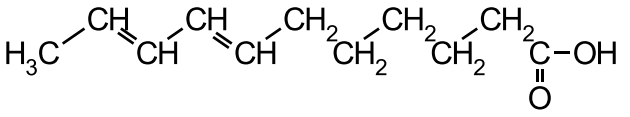


Diagram B

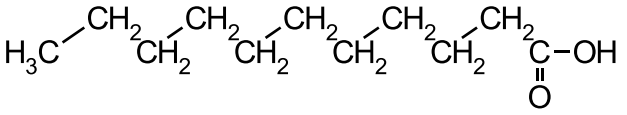


Diagram C

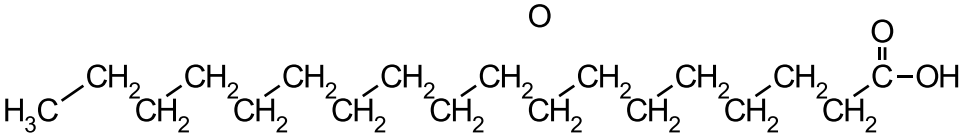


Diagram D

(a) Which fatty acids are unsaturated?

(b) Order the fatty acids from highest to smallest melting point.

(c) Order the fatty acids from least to most dense.

(d) The inclusion of double bonds makes the shape of a fatty acid irregular (not shown in the diagrams above). Redraw diagram A showing how the shape of the fatty acid can change around the double bond. Explain the effect this irregular shape has on the boiling point of the fatty acid.

(e) Which fatty acid is most reactive? Explain.

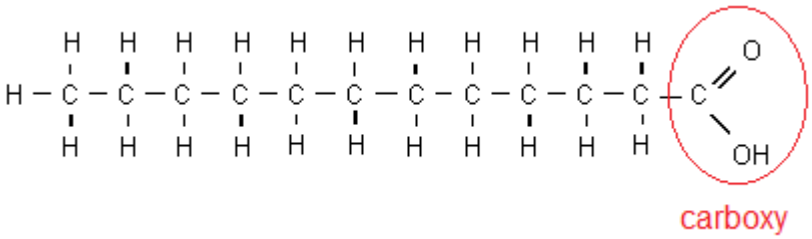
(f) How many mole of hydrogen gas would be needed to completely react with molecule B?

(g) Which fatty acid is most likely to be a liquid at room temperature?

SOLUTIONS

QUESTION 1 Answer is B
QUESTION 2 Answer is A
QUESTION 3 Answer is D
QUESTION 4 Answer is A
QUESTION 5 Answer is C

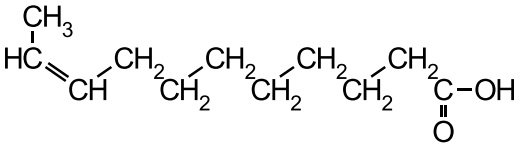
QUESTION 6

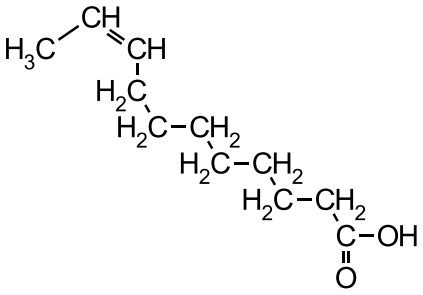


QUESTION 7

(a) A and B
(b) D,B,C,A.
(c) A,B,C,D

(d) The introduction of double bonds lowers the boiling point. The irregular shape of the molecules means they are unable to pack as tightly together which lowers the effective strength of the dispersion forces between the molecules. Since the dispersion forces are weaker, less energy will be needed to separate the molecules and the boiling point decreases.





(e) B since it has more double bonds which are sites where reactions can take place.
(f) 2 mole
(g) B