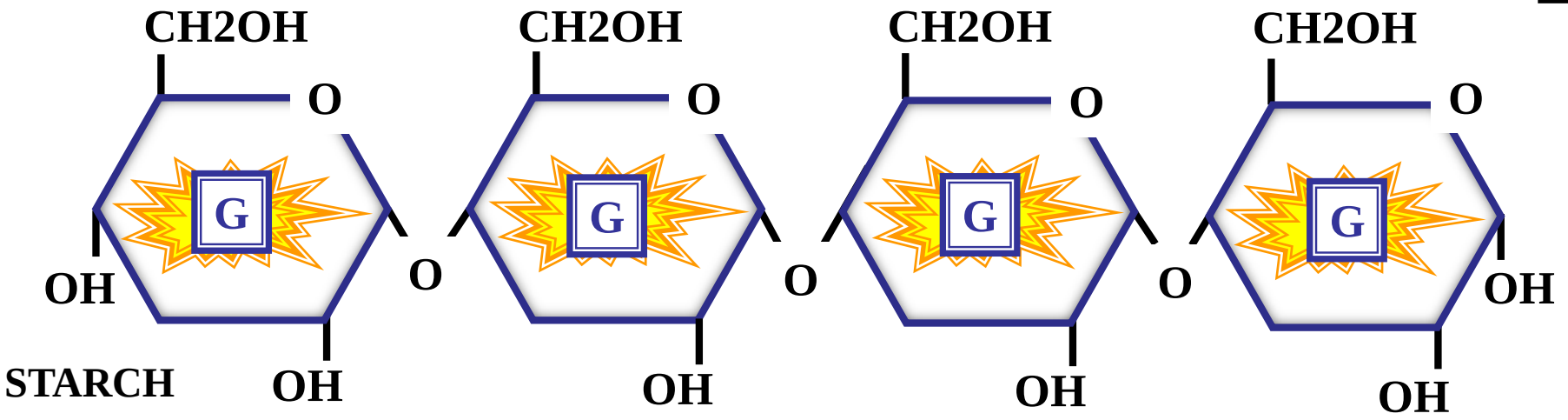
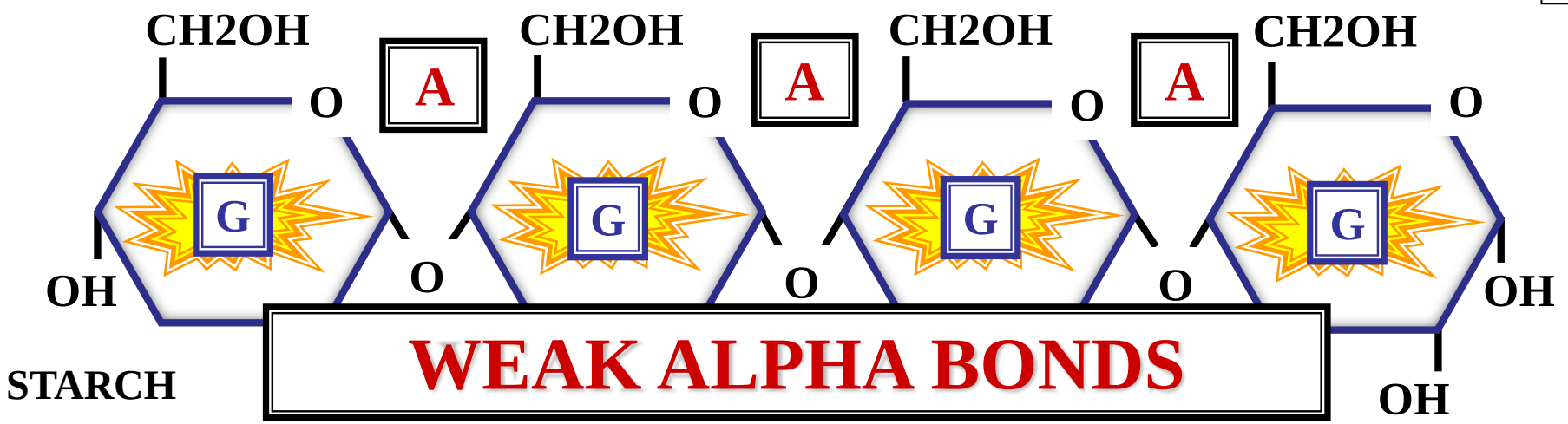



# STARCH = AMYLOSE

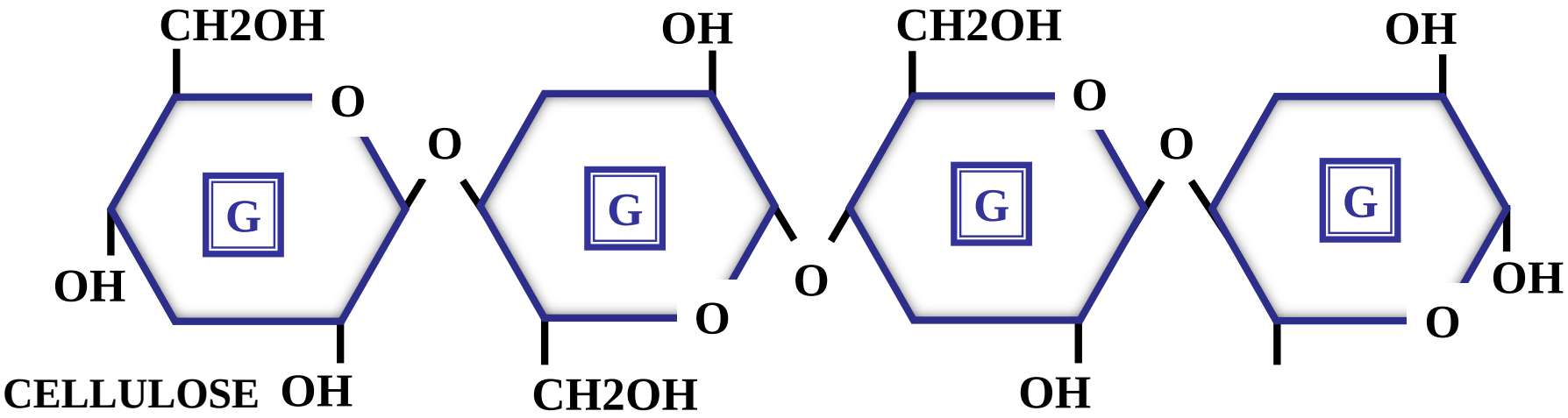
C




# STARCH = AMYLOSE

A = ALPHA BOND

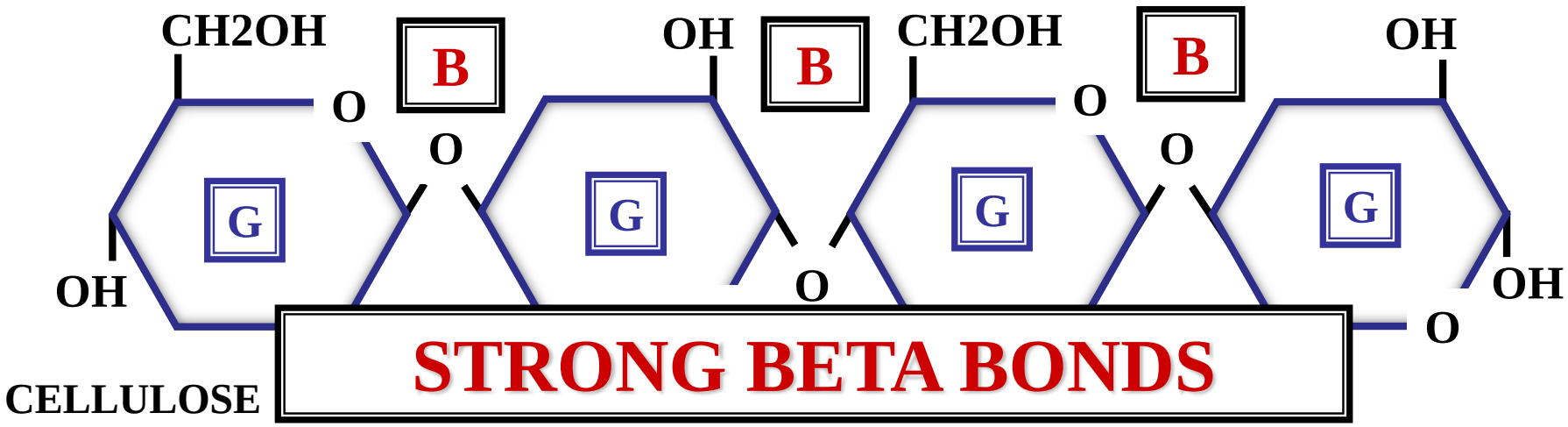
B




# CELLULOSE

G = GLUCOSE

DB

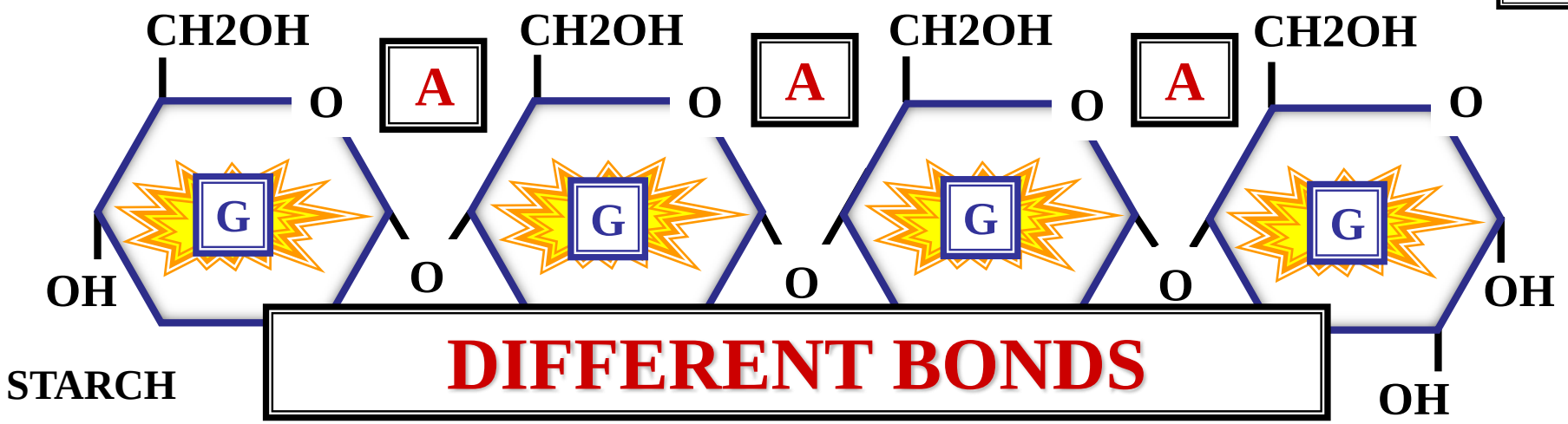



B = BETA BOND

# CELLULOSE

G = GLUCOSE

DS

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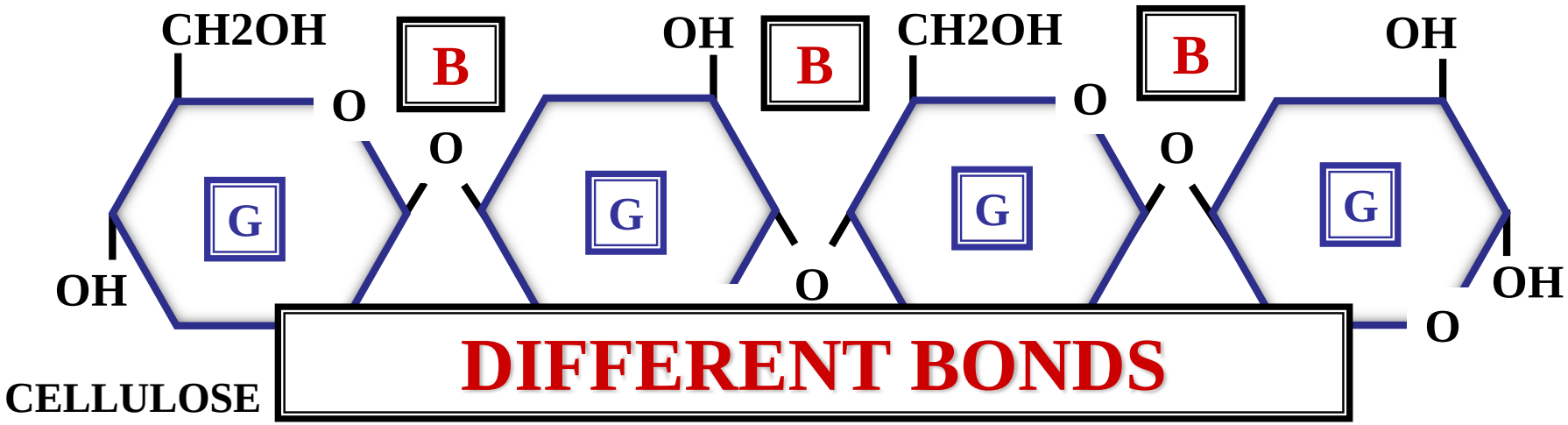
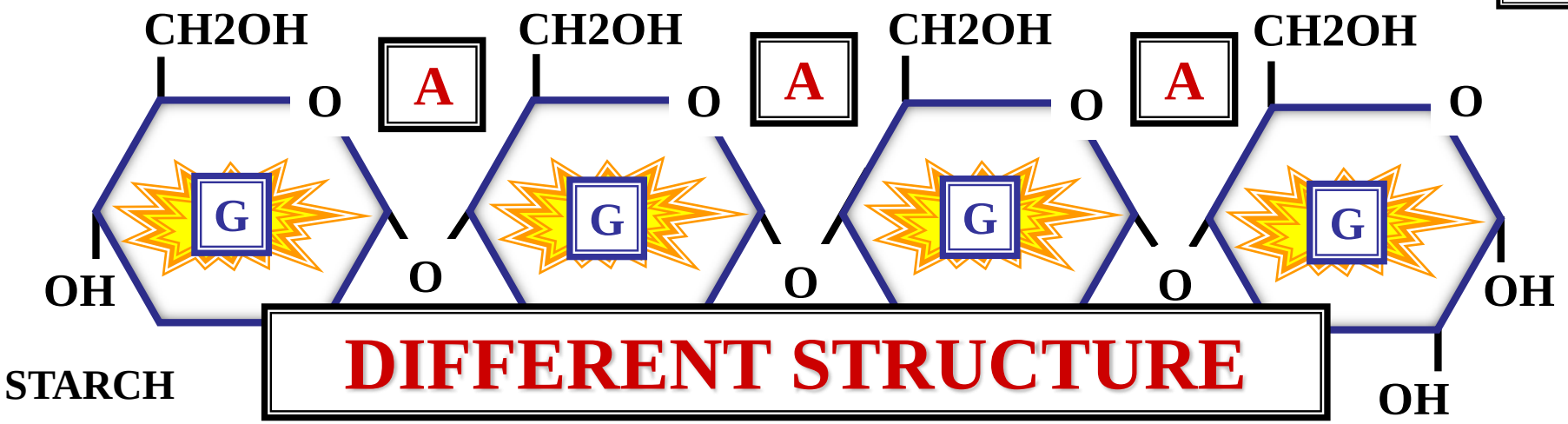



= BOND

# CELLULOSE

G = GLUCOSE

DF

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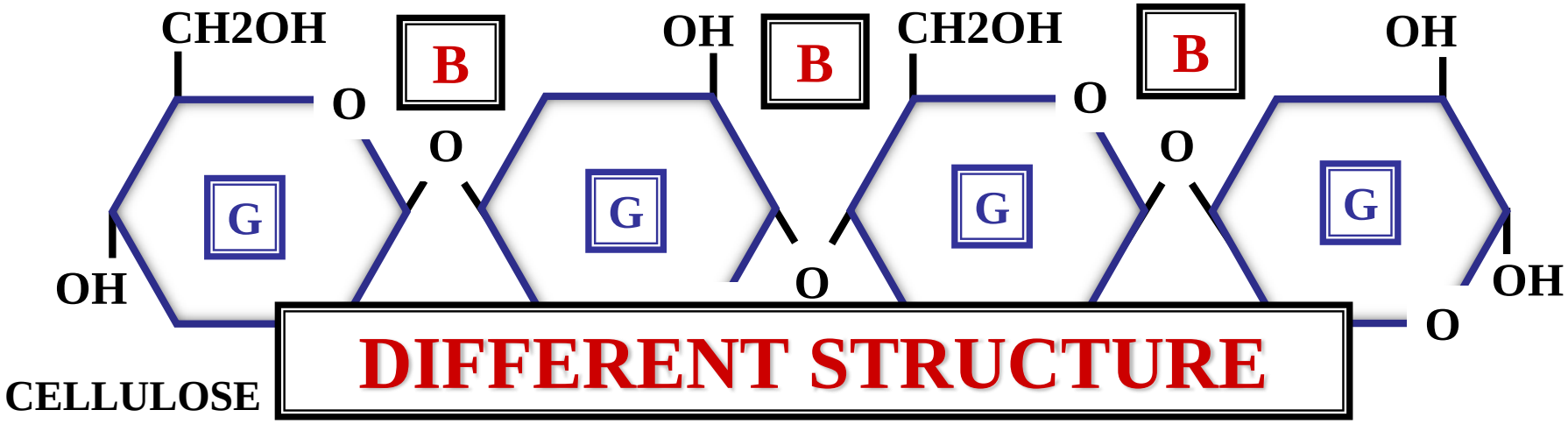


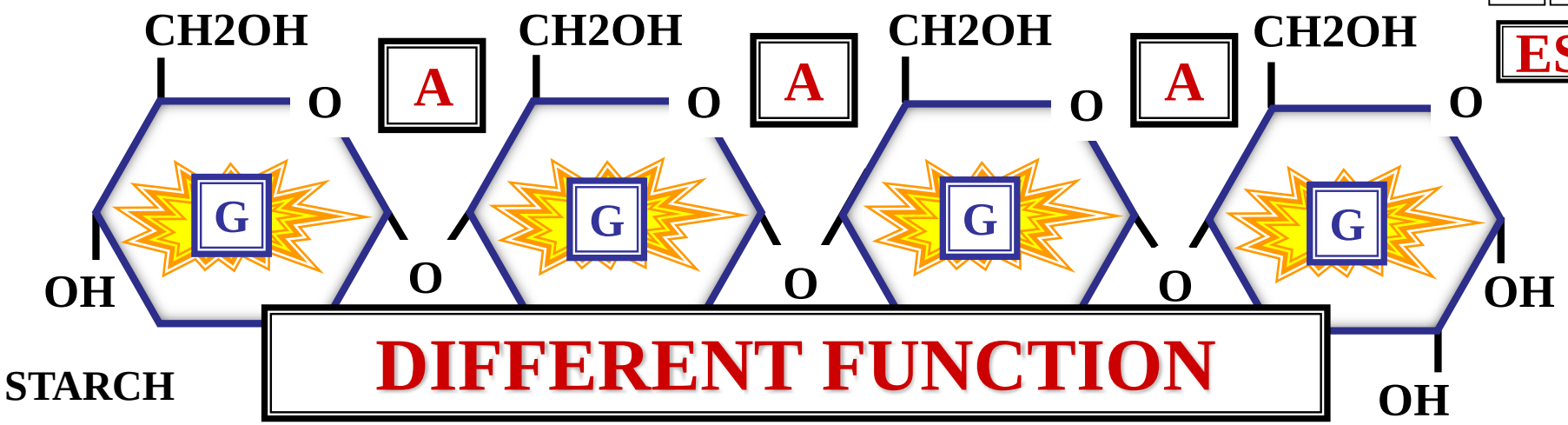

= BOND

# CELLULOSE

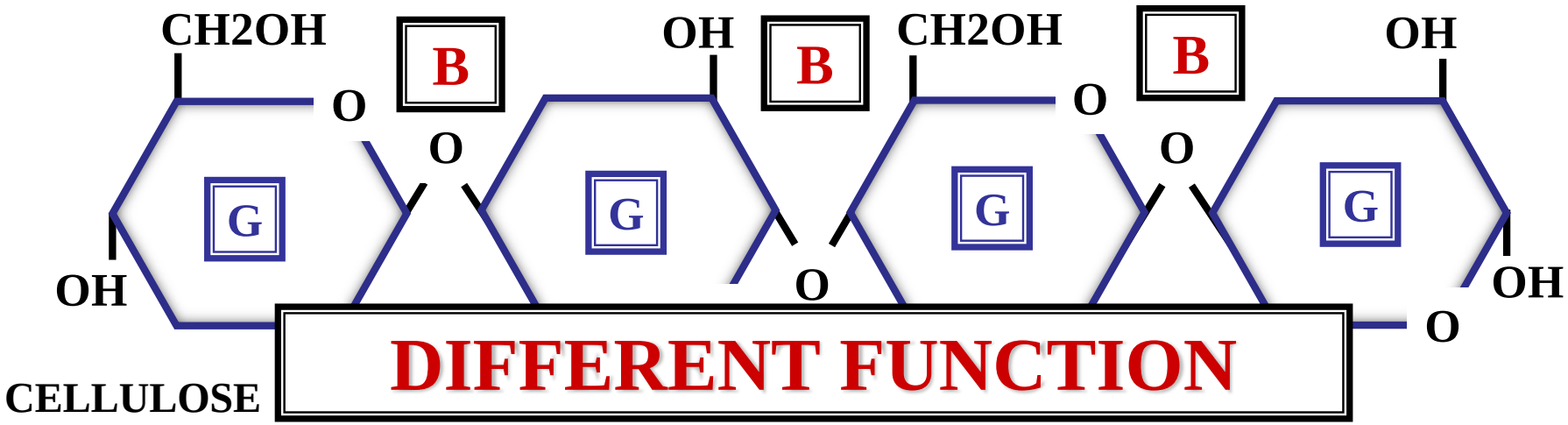
G = GLUCOSE

S ¿

ES




# STARCH = AMYLOSE



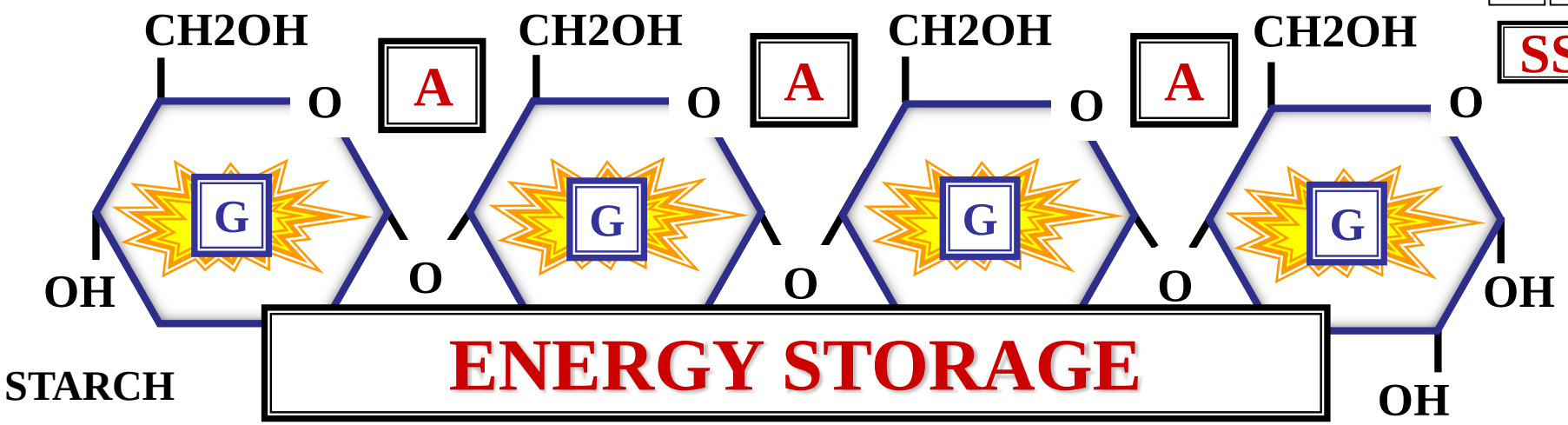

= BOND

# CELLULOSE

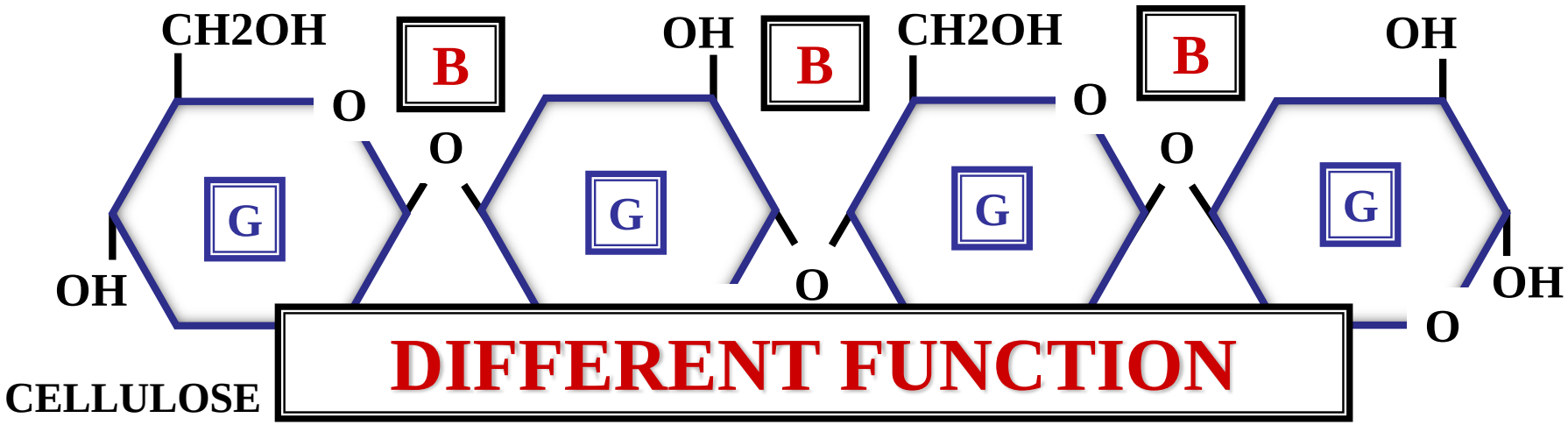
G = GLUCOSE

C ¿

SS



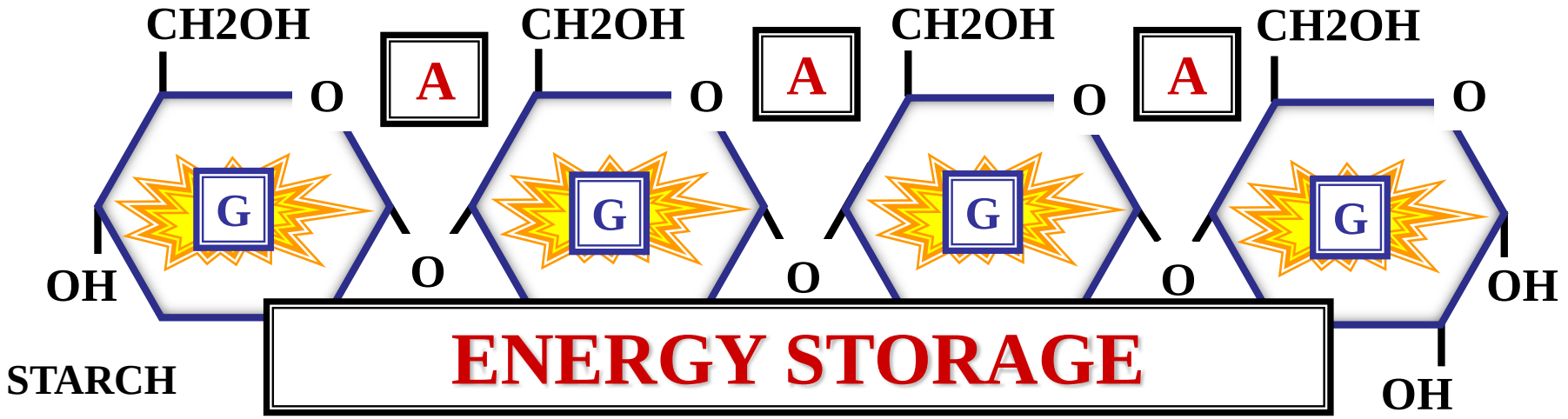

# STARCH = AMYLOSE



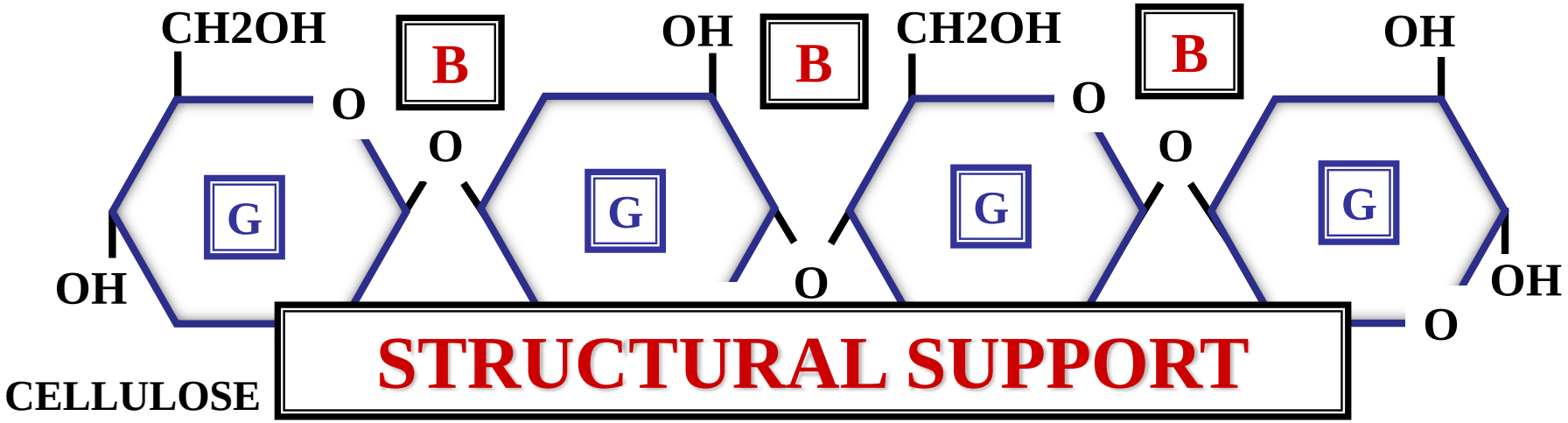

= BOND

# CELLULOSE

G = GLUCOSE




# STARCH = AMYLOSE




= BOND

# CELLULOSE

G = GLUCOSE

# MACROMOLECULE CLASSES

CARBOHYDRATES
LIPIDS
PROTEINS
NUCLEIC ACIDS

# MACROMOLECULE CLASSES

# LIPIDS

# LIPIDS

# LIPIDS

# FATS/OILS AND PHOSPHOLIPIDS

LIPIDS

F

# FATS/OILS

# FAT

O

# FAT

# SOLID
# ROOM TEMPERATURE

# FAT

# OIL

OIL

# LIQUID
# ROOM TEMPERATURE

OIL

# FATS & OILS

F

## ROOM TEMPERATURE

# FATS & OILS

O

## ROOM TEMPERATURE

FATS SOLID

# FATS & OILS

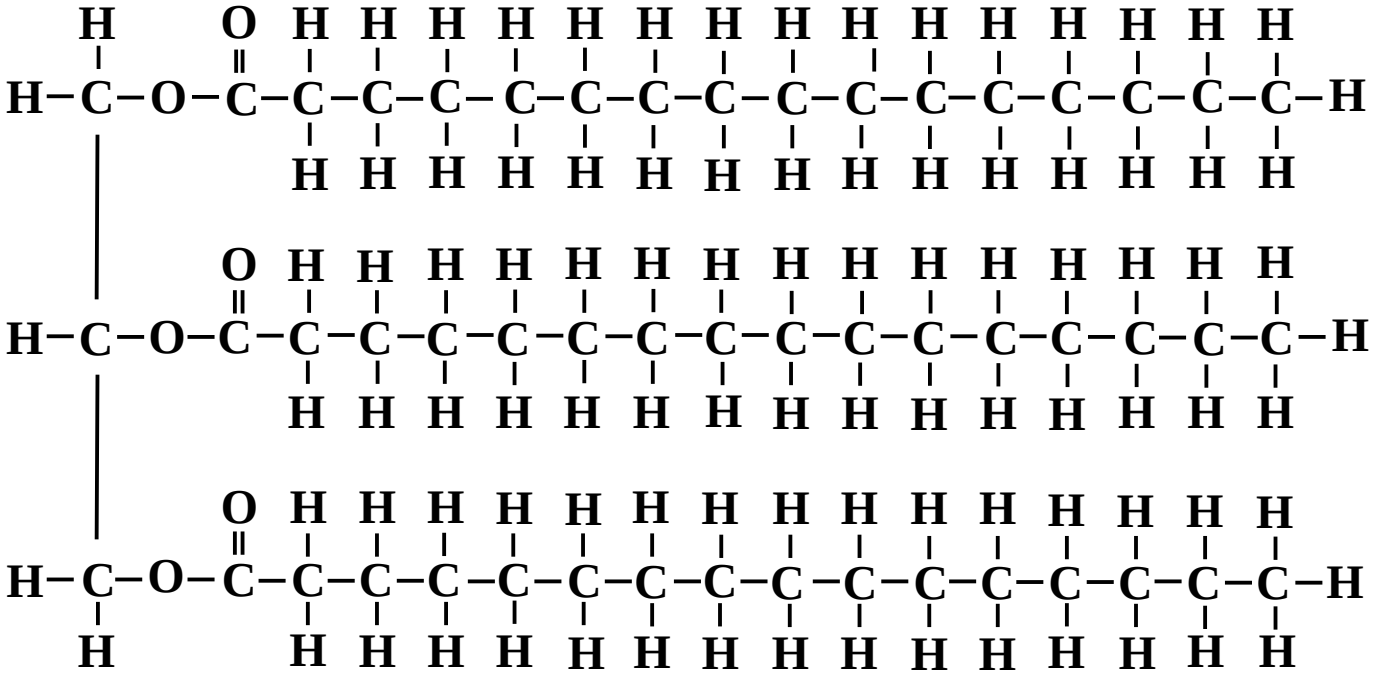
^

## ROOM TEMPERATURE

# FATS/OILS HYDROXYL GROUPS

# FATS/OILS STRUCTURE

AB

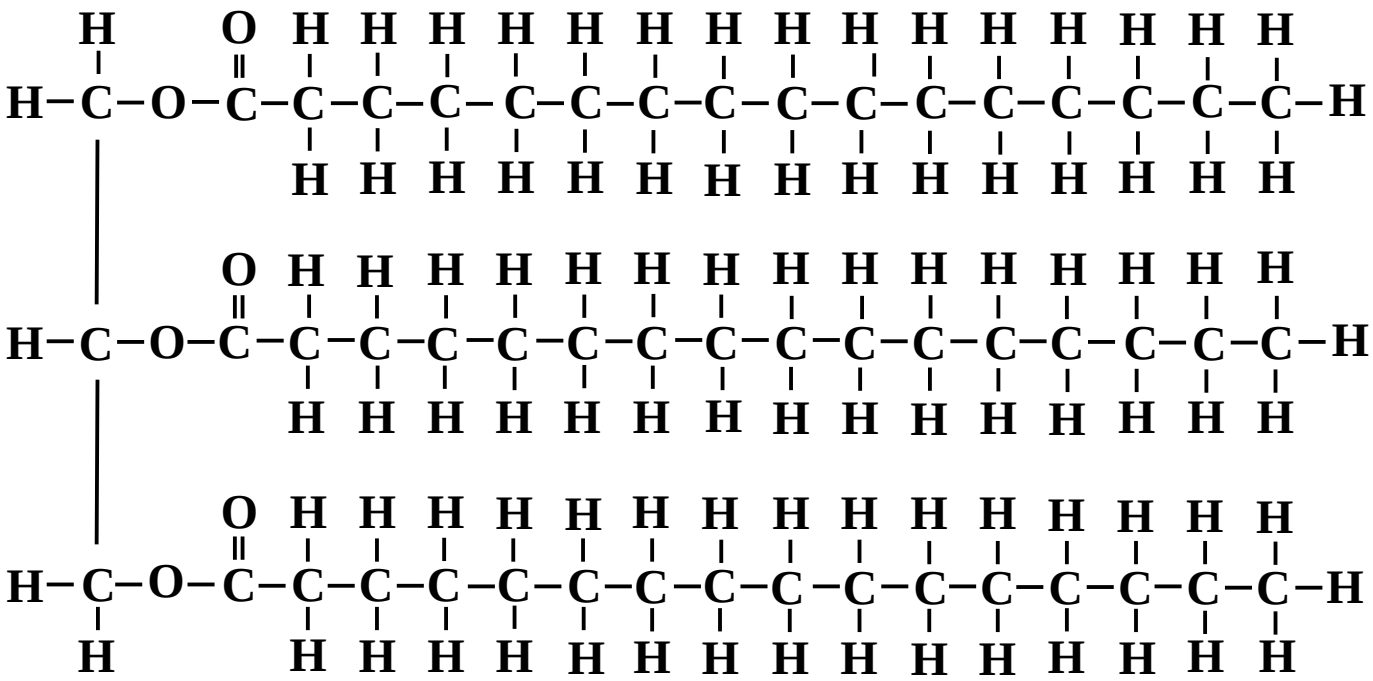


**HYDROXYL GROUPS (OH): ?**

# FATS/OILS STRUCTURE

OH

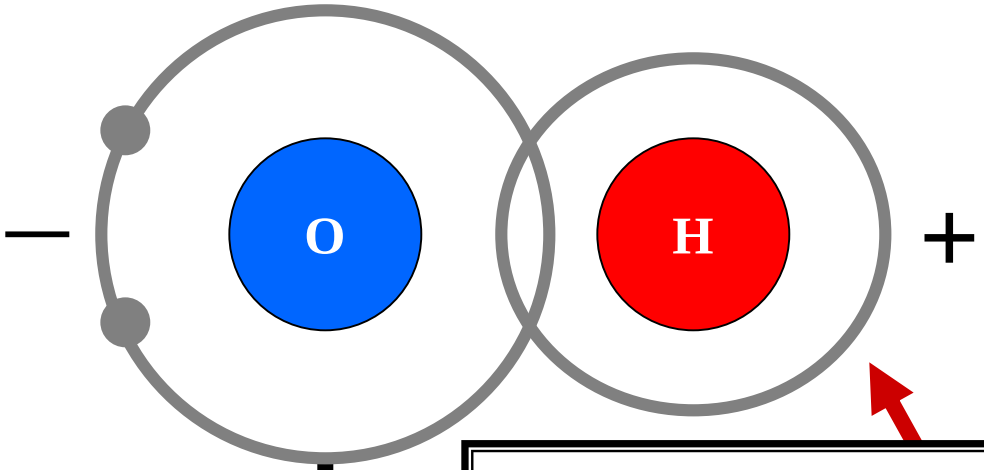
+



**HYDROXYL GROUPS (OH): ABSENT**

AB

# FATS/OILS & WATER




**POLAR HYDROXYL GROUPS**

**FATS/OILS**

● = E-

NP

# FATS/OILS & WATER

**POLAR HYDROXYL GROUPS: ABSENT**

**FATS/OILS**

= E-

# FATS/OILS & WATER

**POLAR HYDROXYL GROUPS: ABSENT**

~ **FATS/OILS** ~

**NON-POLAR**

● = E-

# FATS/OILS & WATER

**POLAR HYDROXYL GROUPS: ABSENT**

~ **FATS/OILS** ~

**NON-POLAR**

**AQUEOUS SOLUTION**

● = E-

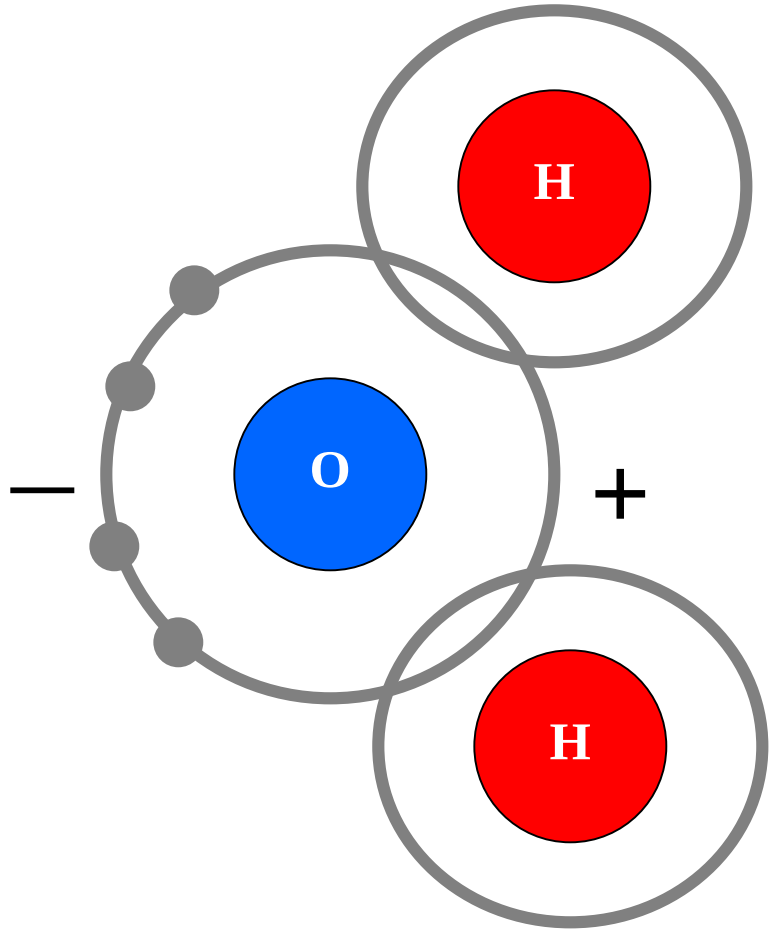
# FATS/OILS & WATER

¿
//

~ FATS/OILS ~

NON-POLAR

AQUEOUS SOLUTION




POLAR

WATER

= E-

AB

# FATS/OILS & WATER

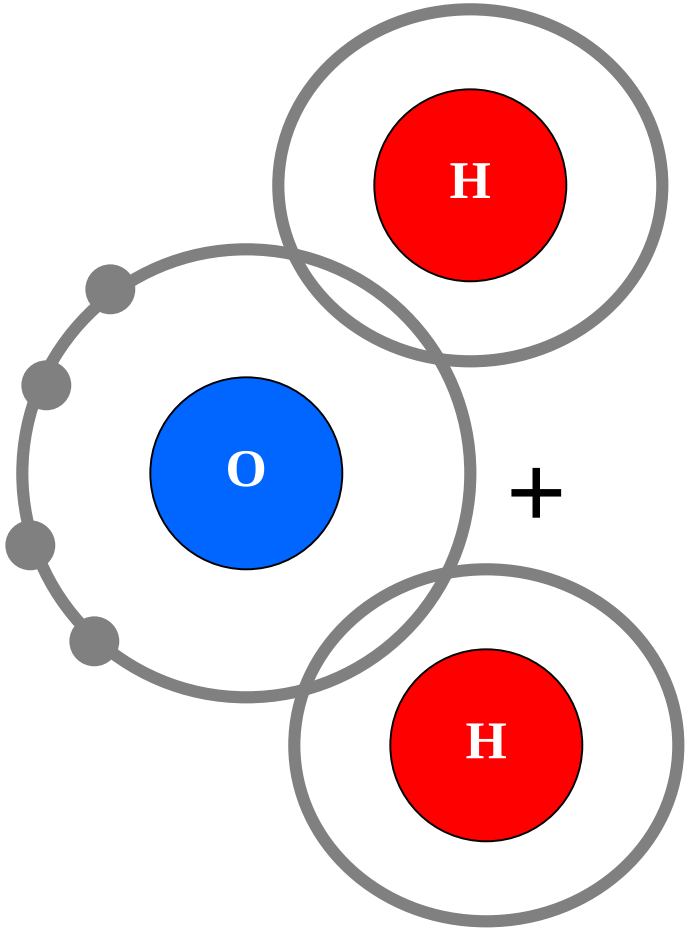
HYDROGEN BONDS

~ FATS/OILS ~

NON-POLAR

AQUEOUS SOLUTION

//–




POLAR

WATER

● = E-

RE

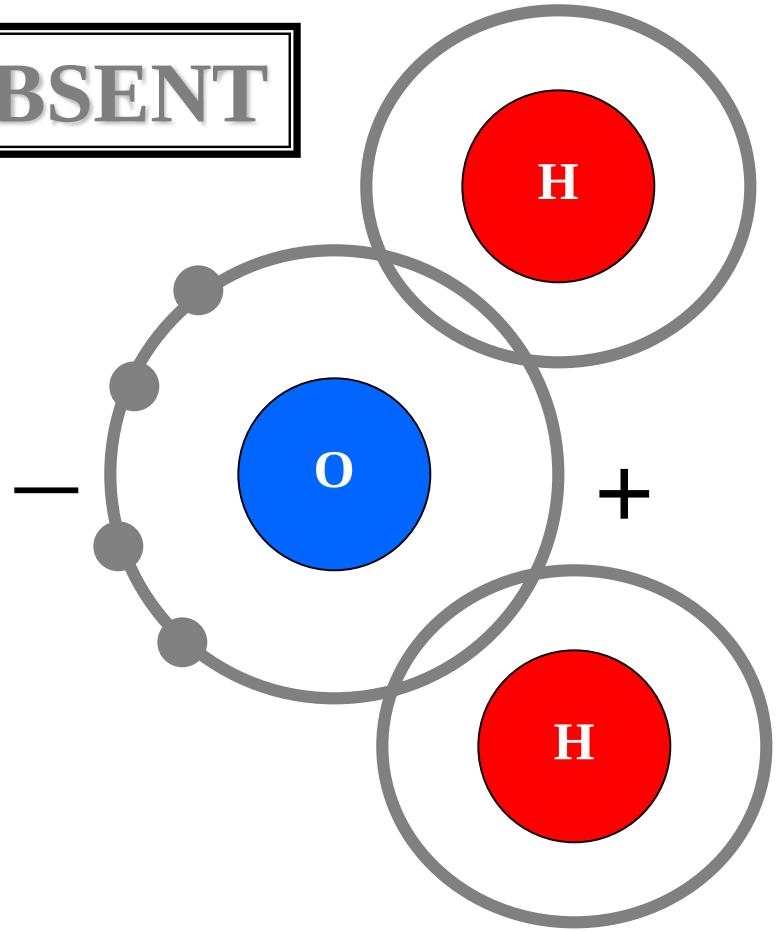
# FATS/OILS & WATER

**HYDROGEN BONDS: ABSENT**

~ **FATS/OILS** ~

NON-POLAR

**AQUEOUS SOLUTION**




POLAR

**WATER**

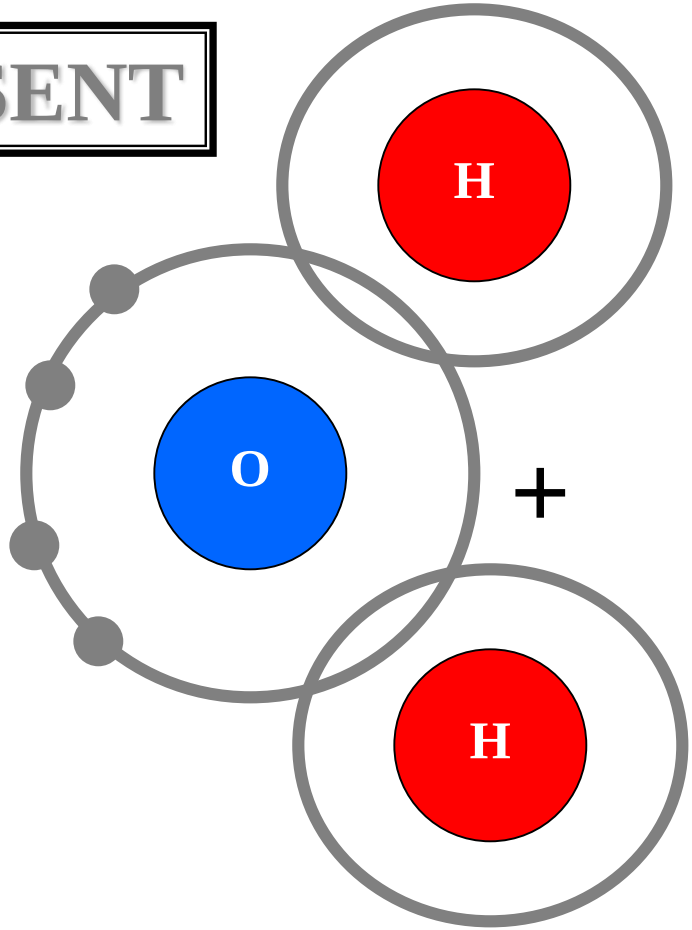
● = E-

# FATS/OILS & WATER

**HYDROGEN BONDS: ABSENT**

~ **FATS/OILS** ~ **REPEL** —

**NON-POLAR**




+

**AQUEOUS SOLUTION**

**POLAR**

**WATER**

● = E-

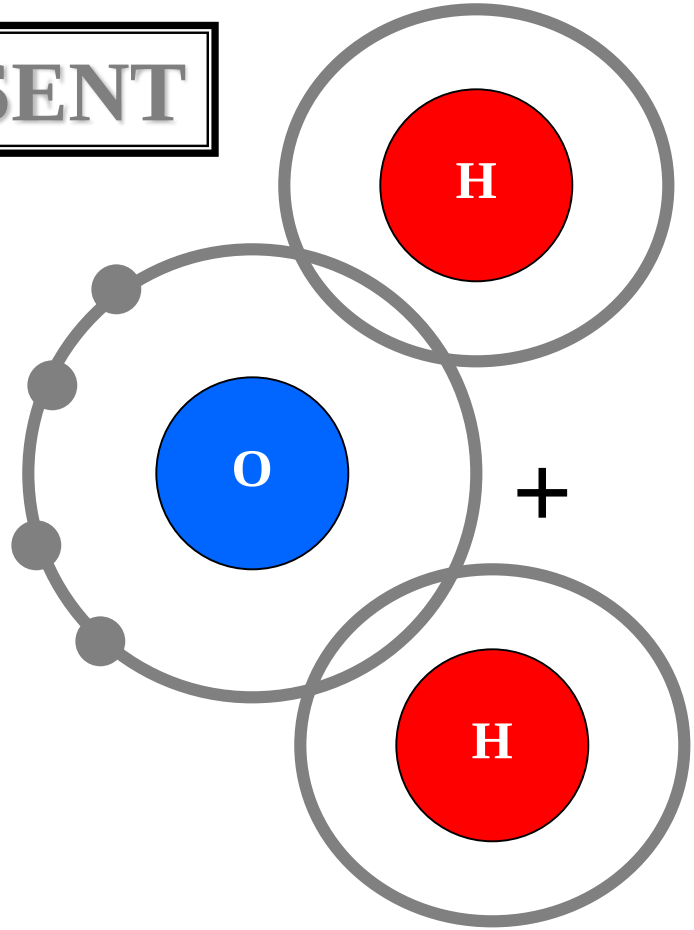
# FATS/OILS & WATER

**HYDROGEN BONDS: ABSENT**

**HYDROPHOBIC**

~ **FATS/OILS** ~ **REPEL** —

**NON-POLAR**




**AQUEOUS SOLUTION**

**POLAR**

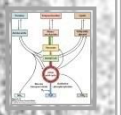
**WATER**

● = E-


OIL SPILL

# FATS/OILS FUNCTION

# FATS & OILS ENERGY STORAGE FUNCTION



PLANT CELL

# CELL METABOLISM

PROTEINS

CARBOHYDRATES

LIPIDS

AMINO ACIDS

SUGARS

FATS/OILS

PYRUVATE

ACETYL CO-A

KREBS CYCLE

ELECTRON TRANSPORT CHAIN

OXIDATIVE PHOSPHORYLATION

OXYGEN

NITRATES

WATER

CARBON DIOXIDE

# FATS/OILS STRUCTURE

# FATS/OILS STRUCTURAL COMPONENTS

# FATS/OILS STRUCTURAL COMPONENTS

## 1 GLYCEROL

# FATS/OILS STRUCTURAL COMPONENTS

# FATS/OILS STRUCTURAL COMPONENTS

1 GLYCEROL

3 FATTY ACIDS

# FATS/OILS STRUCTURAL COMPONENTS

# GYLCEROL

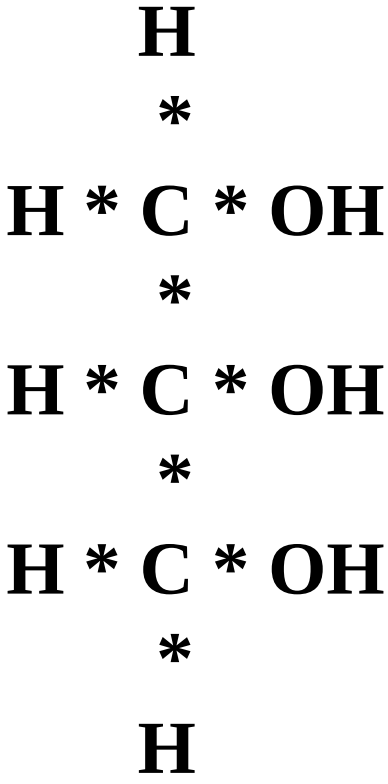
# GYLCEROL

# GLYCEROL

## HYDROCARBON WITH 3 OH GROUPS

GLYCEROL

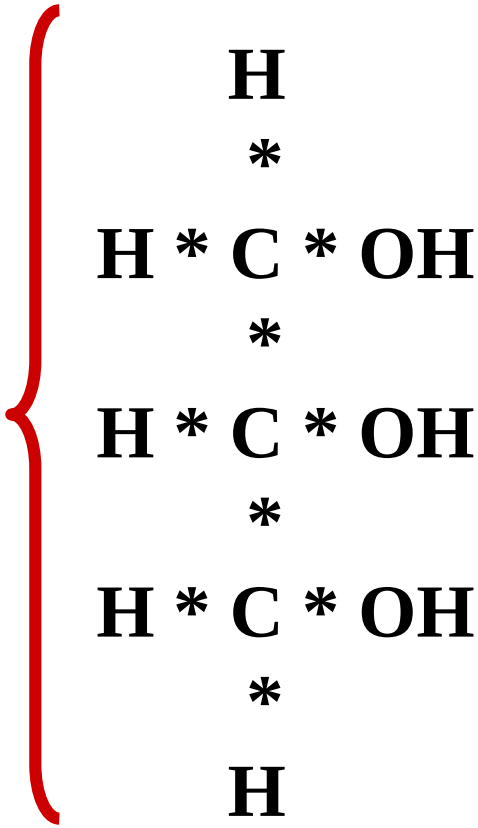
# FATS/OILS STRUCTURE




# GLYCEROL

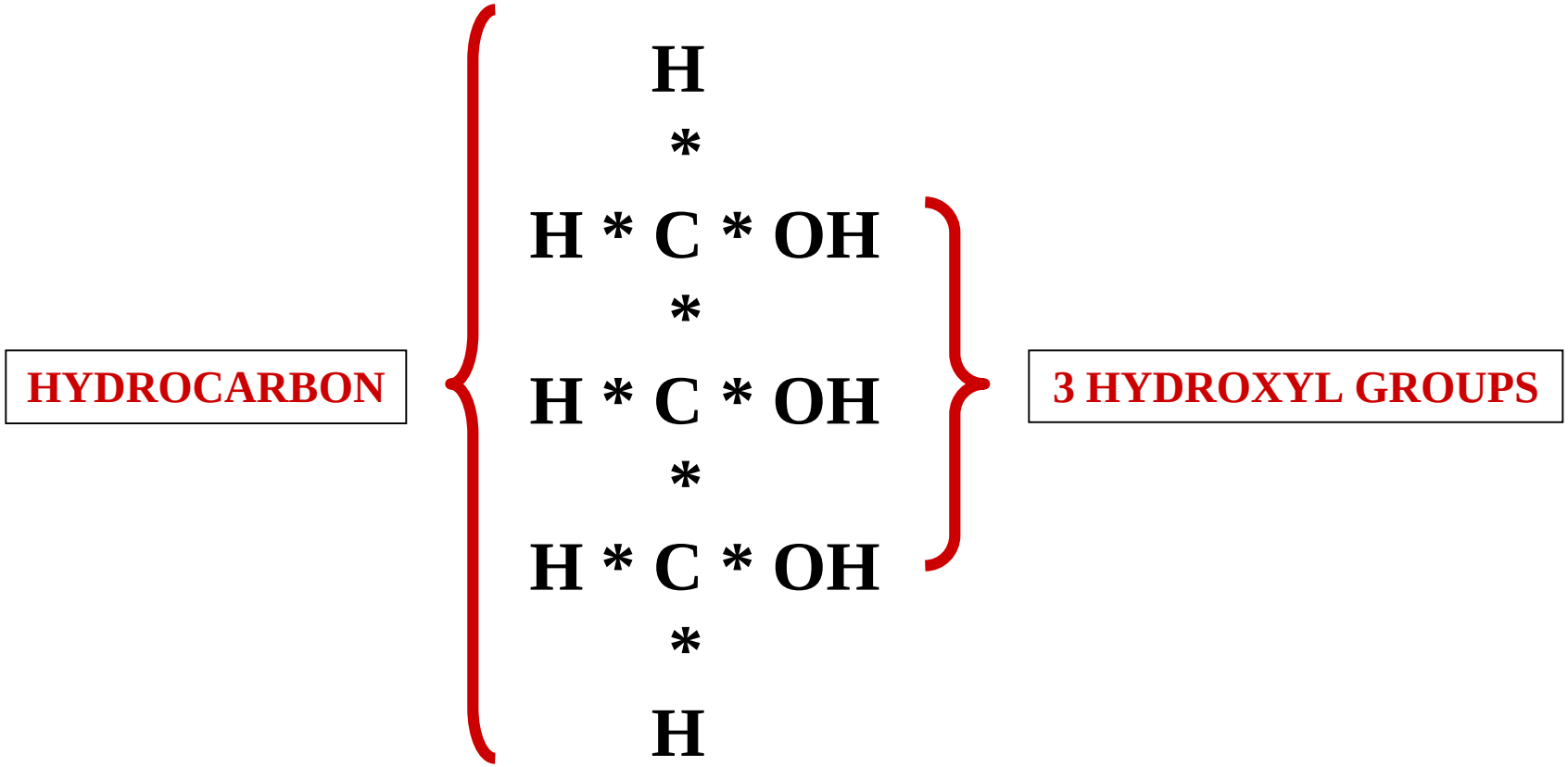
# FATS/OILS STRUCTURE

HYDROCARBON




GLYCEROL

# FATS/OILS STRUCTURE




## GLYCEROL

F

# FATTY ACIDS

# FATTY ACID

# FATTY ACID

# HYDROCARBON WITH A TERMINAL COOH FUNCTIONAL GROUP

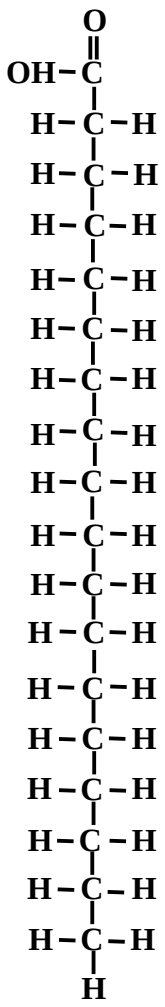
FATTY ACID

# FATTY ACID

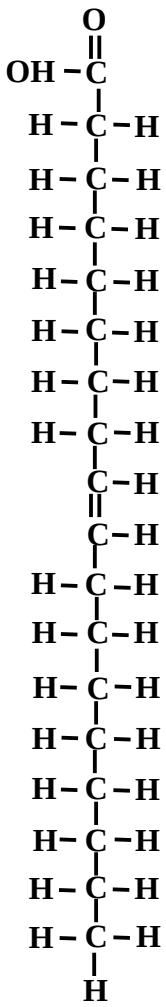
HYDROCARBON WITH A TERMINAL COOH (CARBOXYL) FUNCTIONAL GROUP

FATTY ACID

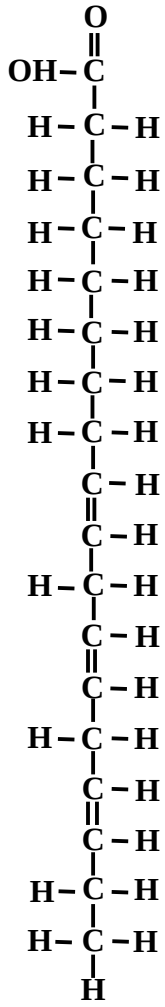
# FATTY ACID STRUCTURE



**STEARIC F.A.**

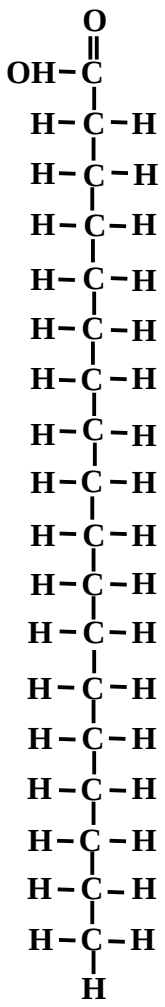


**OLEIC F.A.**

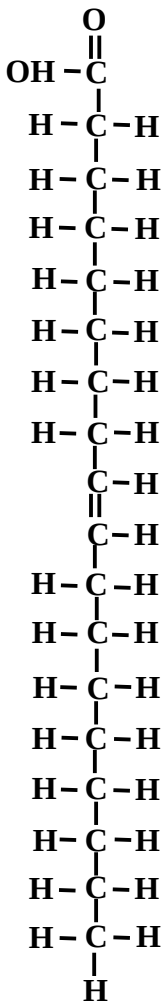


**LINOLENIC F.A.**

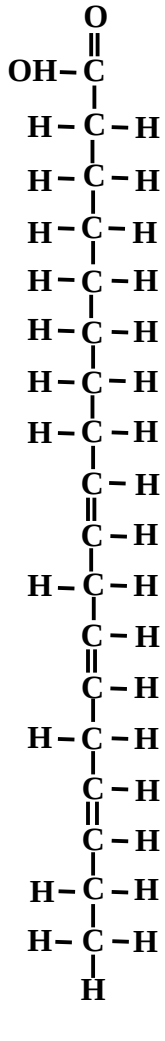
# FATTY ACID STRUCTURE



STEARIC F.A.



OLEIC F.A.

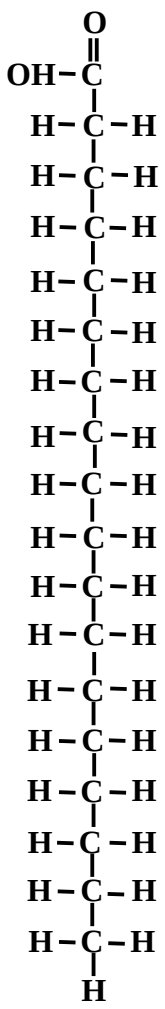


LINOLENIC F.A.

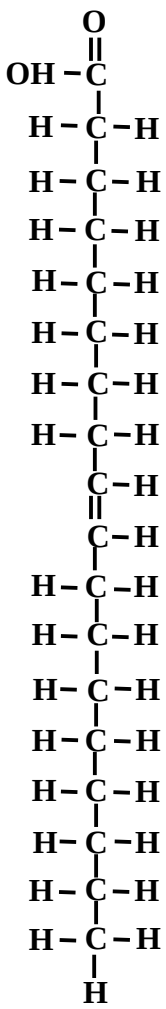
HYDROCARBON

ST

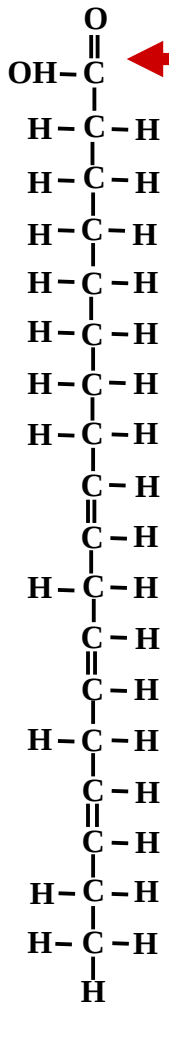
# FATTY ACID STRUCTURE



STEARIC F.A.



OLEIC F.A.

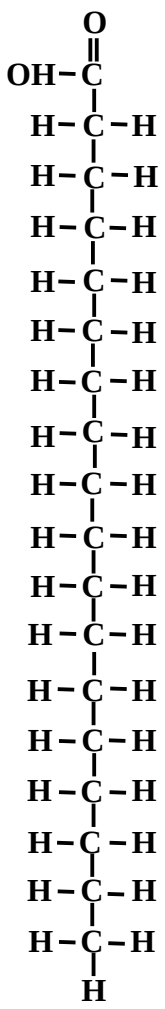


LINOLENIC F.A.

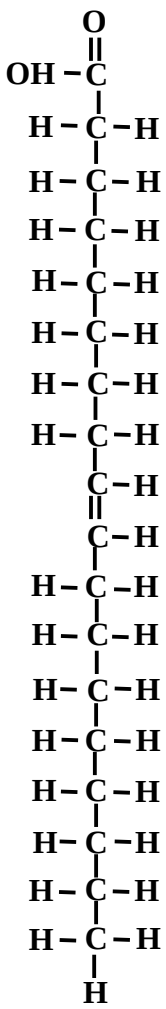
**TERMINAL CARBOXYL**
**COOH**

**HYDROCARBON**

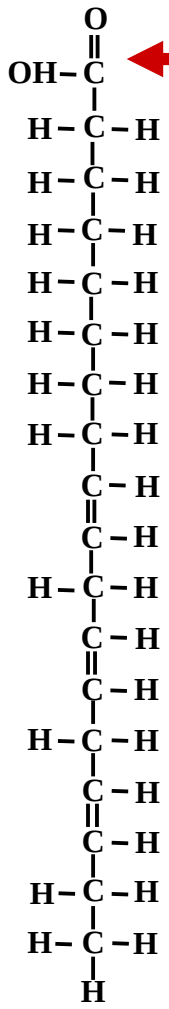
# FATTY ACID STRUCTURE



STEARIC F.A.



OLEIC F.A.

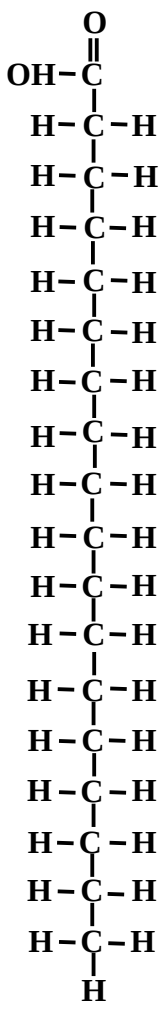


LINOLENIC F.A.

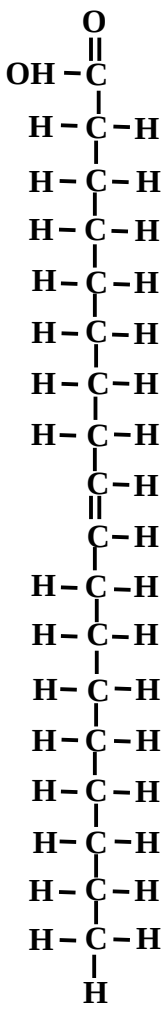
**TERMINAL CARBOXYL**
**COOH**
**STANDARD**

**HYDROCARBON**

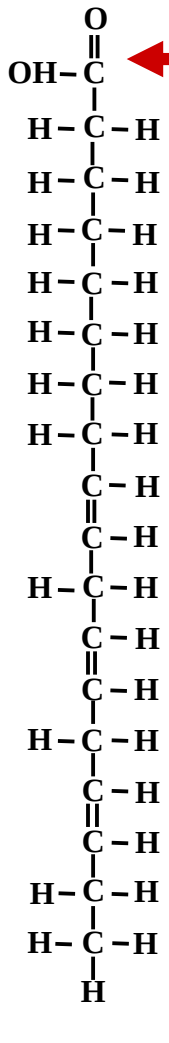
# FATTY ACID STRUCTURE



STEARIC F.A.



OLEIC F.A.



LINOLENIC F.A.

**TERMINAL CARBOXYL COOH STANDARD**

**HYDROCARBON STRUCTURE DIFFERS**

S

# SATURATED FATTY ACID VS UNSATURATED FATTY ACID

# SATURATED FATTY ACID

# SATURATED FATTY ACID

## CARBON TO CARBON DOUBLE BONDS ABSENT

## C=C

# SATURATED FATTY ACID

# UNSATURATED FATTY ACID

AP

# UNSATURATED FATTY ACID

## CARBON TO CARBON DOUBLE BONDS PRESENT

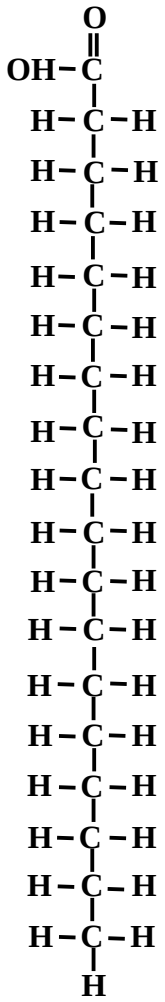
## C=C

UNSATURATED FATTY ACID

# SATURATED VS UNSATURATED FATTY ACIDS APPLIED

# FATTY ACID STRUCTURE

AB



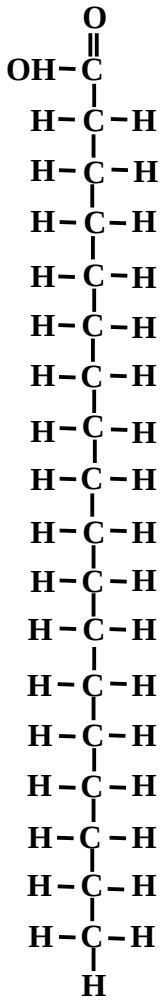
HYDROCARBON

C = C

?

**STEARIC F.A.**

# FATTY ACID STRUCTURE



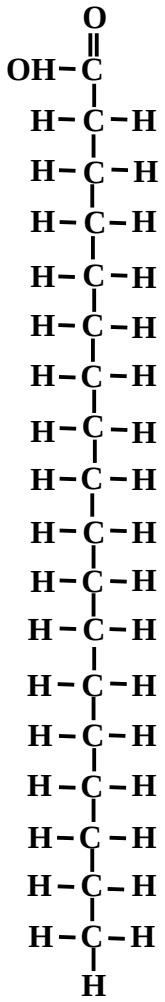
HYDROCARBON

C = C

ABSENT

STEARIC F.A.

# FATTY ACID STRUCTURE



HYDROCARBON

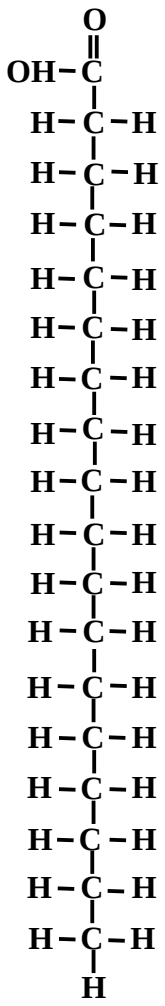
SATURATED

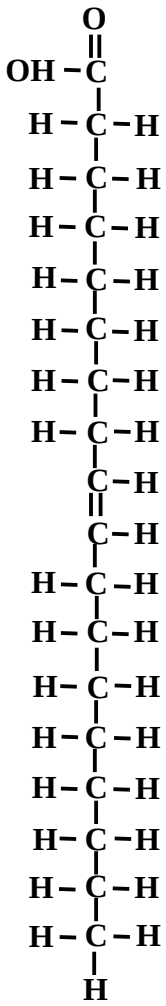
**STEARIC F.A.**

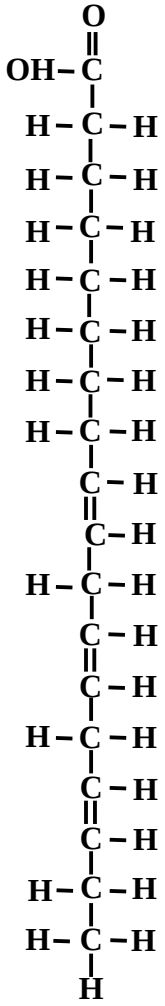
# FATTY ACID STRUCTURE

PR

HYDROCARBON







C = C

?

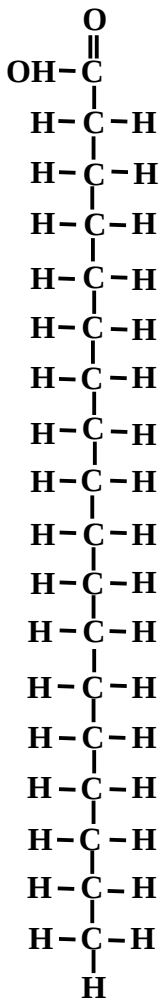
STEARIC F.A.

OLEIC F.A.

LINOLENIC F.A.

# FATTY ACID STRUCTURE

HYDROCARBON



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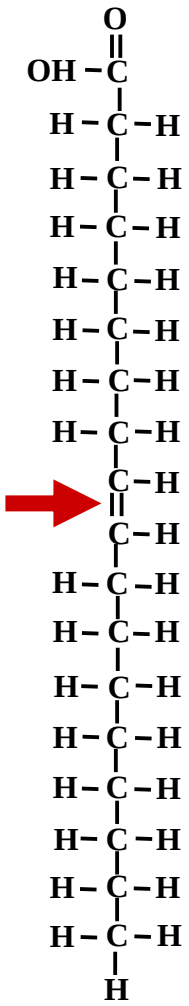
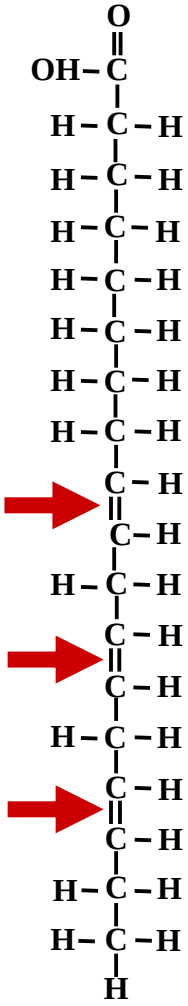


OLEIC F.A.

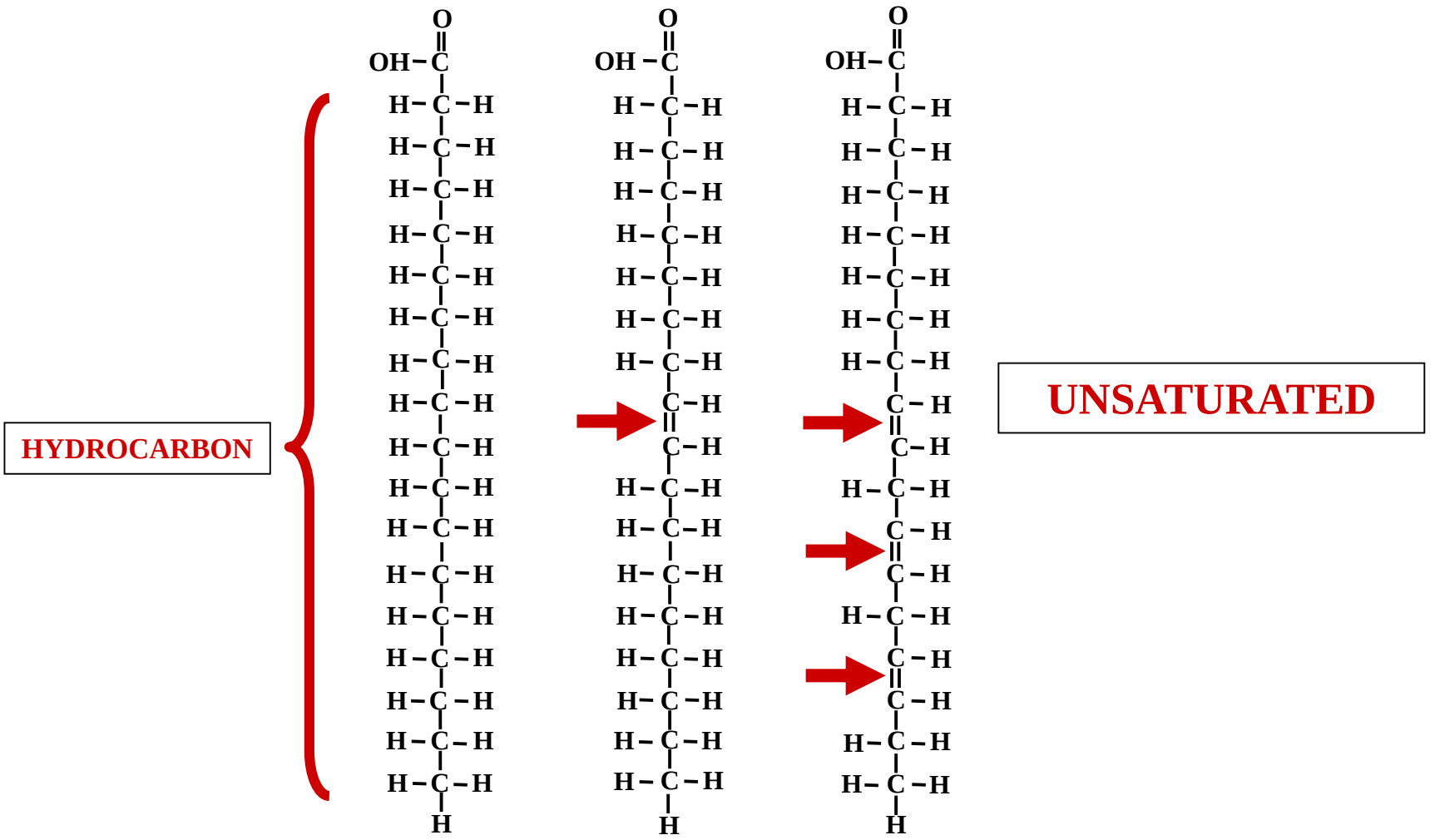


LINOLENIC F.A.

C = C

PRESENT

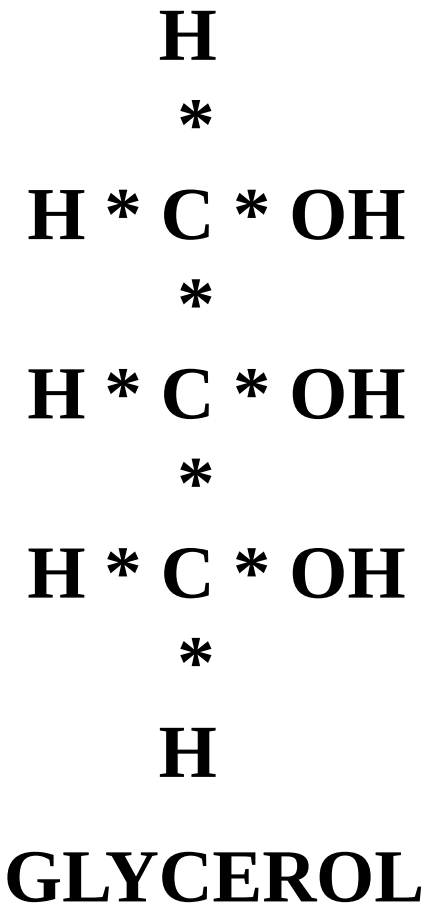
# FATTY ACID STRUCTURE



# FATS/OILS STRUCTURAL COMPONENTS

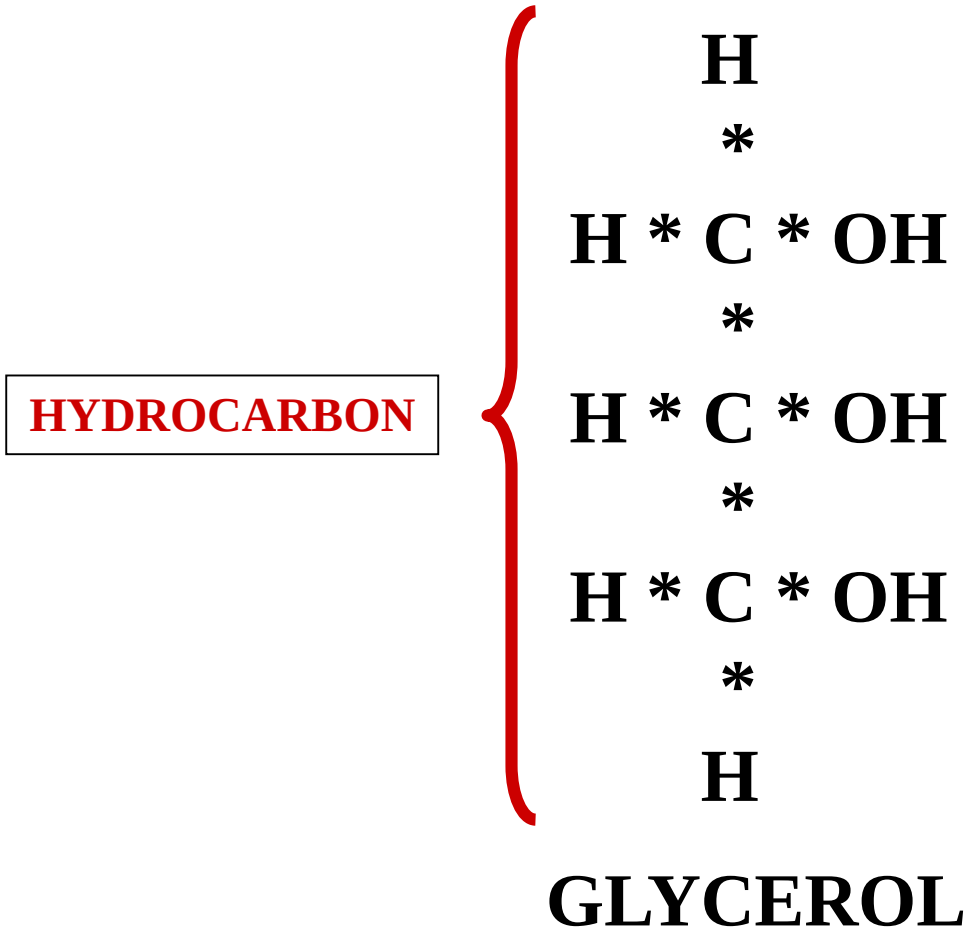
## SUMMARY

# GLYCEROL STRUCTURE

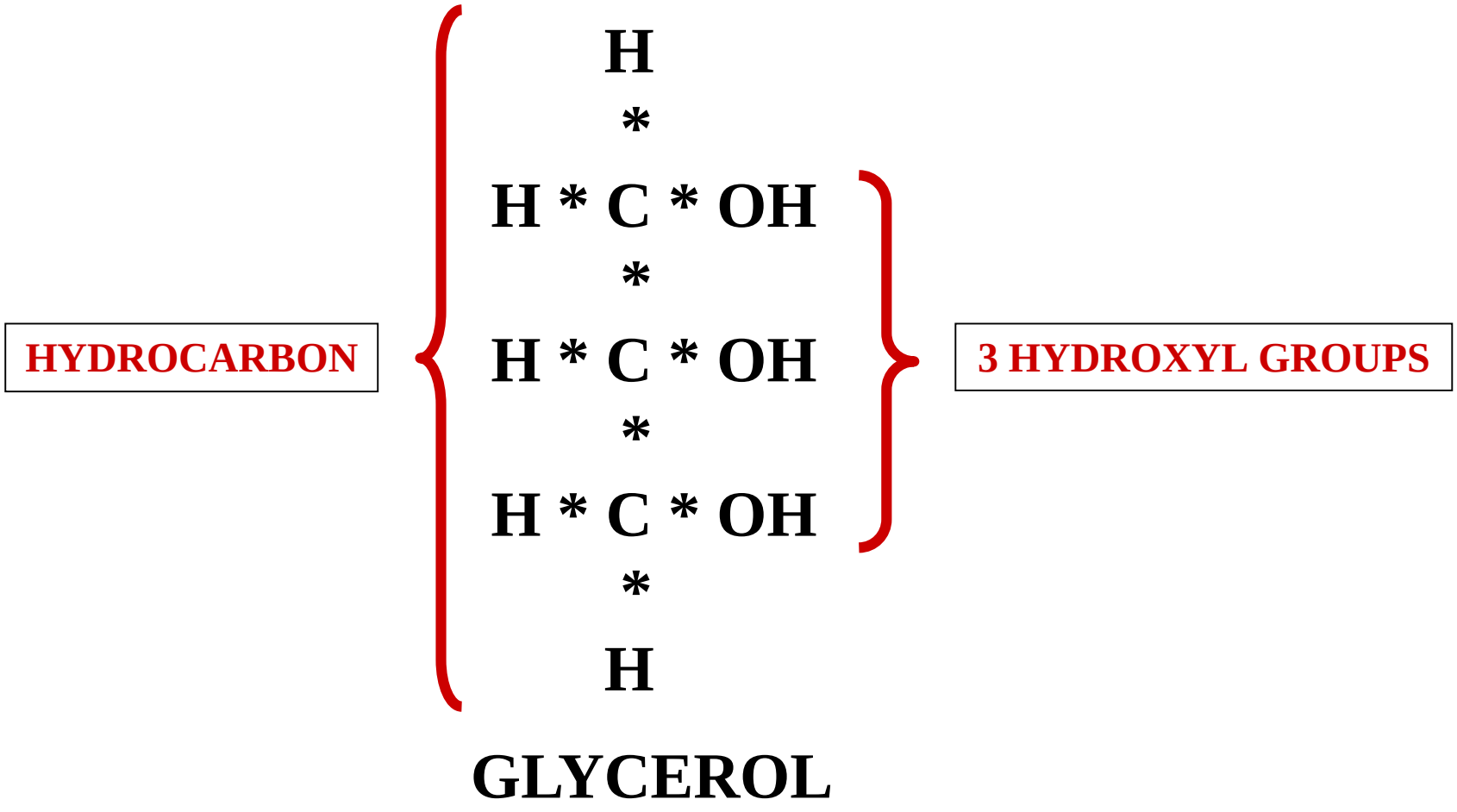



GLYCEROL

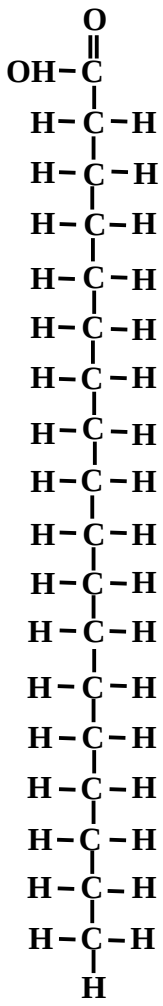
# GLYCEROL STRUCTURE



# GLYCEROL STRUCTURE



# FATTY ACID STRUCTURE



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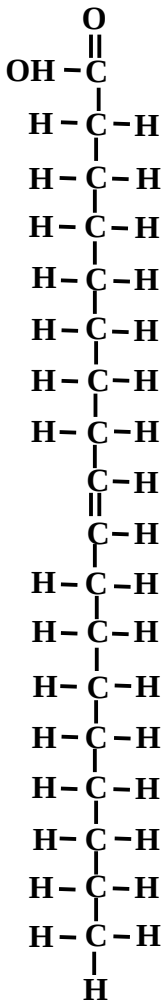

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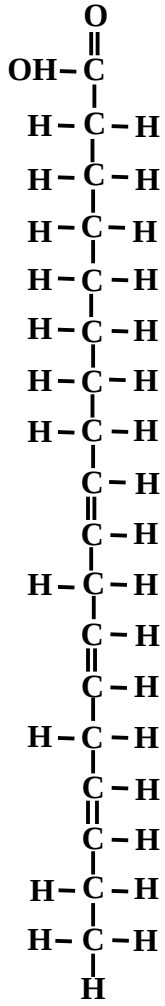
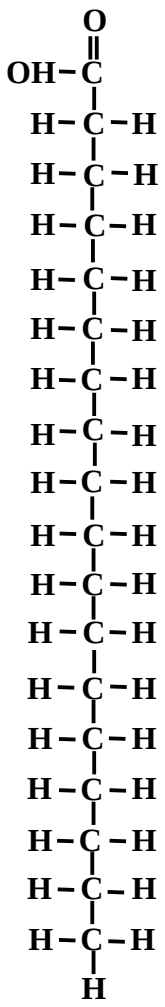


LINOLENIC F.A.

FATTY ACIDS

# FATTY ACID STRUCTURE

**FATTY ACIDS**



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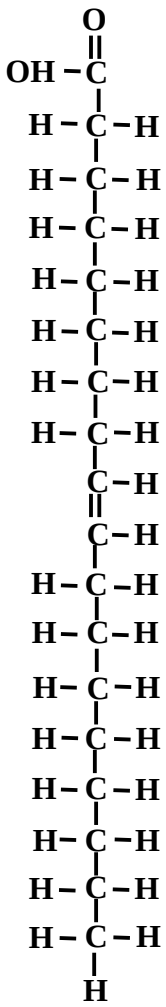

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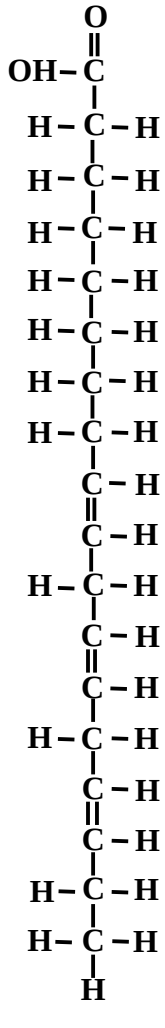


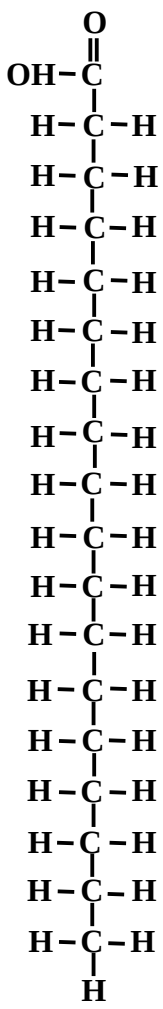
**LINOLENIC F.A.**

**HYDROCARBON**

# FATTY ACID STRUCTURE

BD

**FATTY ACIDS**



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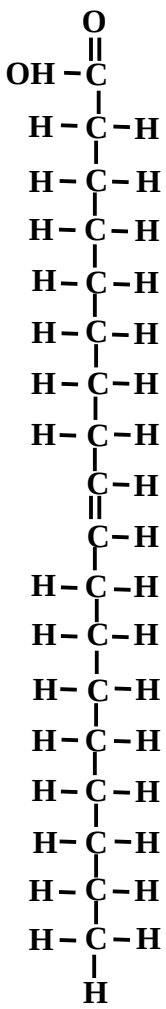

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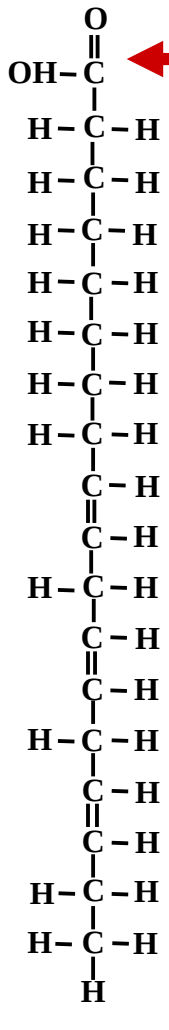


**LINOLENIC F.A.**

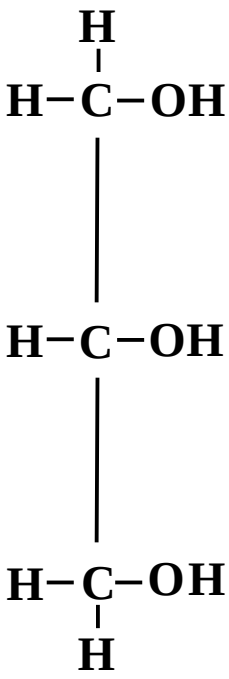
**TERMINAL CARBOXYL**
**COOH**

**HYDROCARBON**

G

# GLYCEROL AND BOND 3 FATTY ACIDS TO THE GLYCEROL

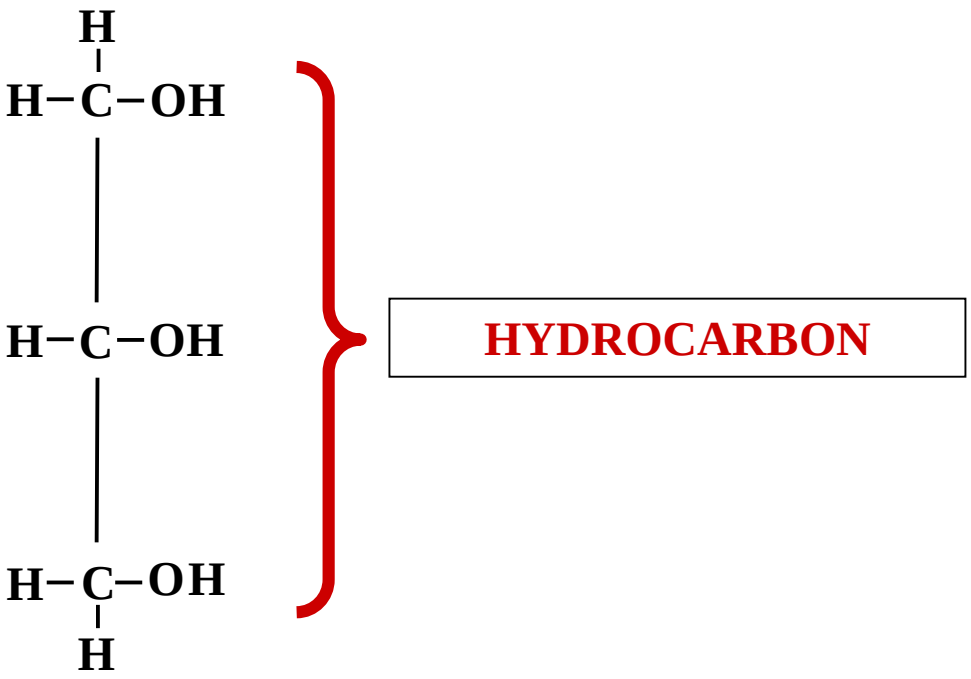
# FATS/OILS STRUCTURE



**GLYCEROL**

# FATS/OILS STRUCTURE

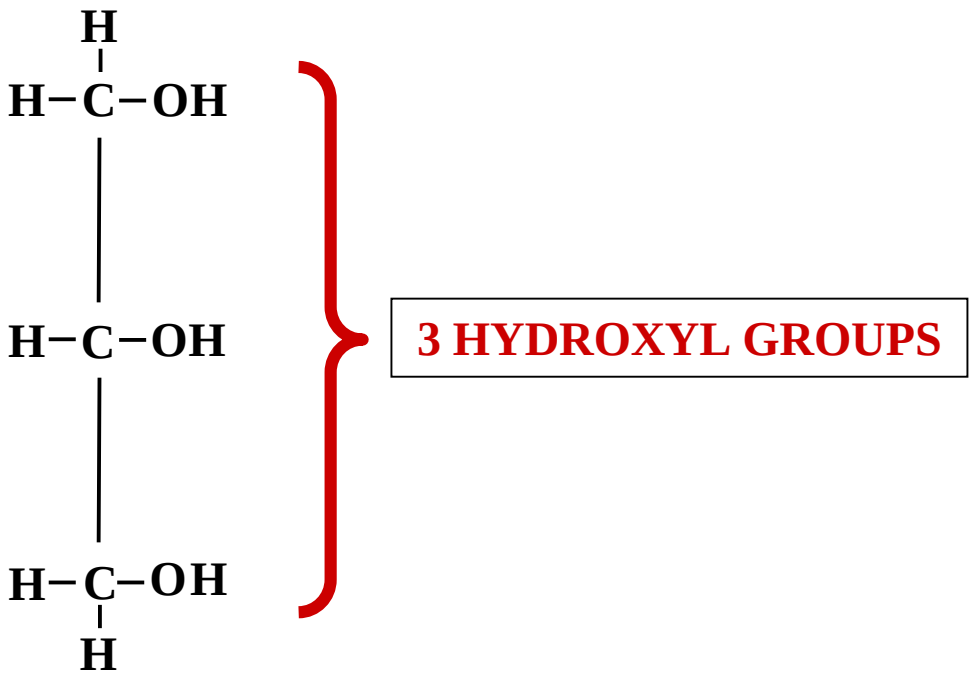





**GLYCEROL**

# FATS/OILS STRUCTURE

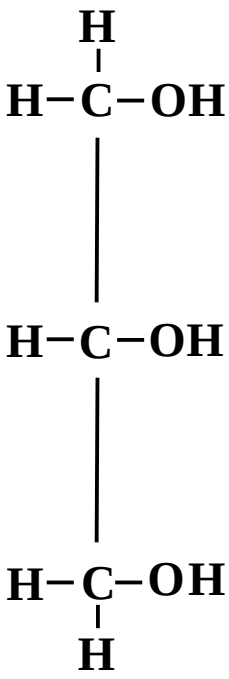
3FA




## GLYCEROL

# FATS/OILS STRUCTURE

BD



GLYCEROL

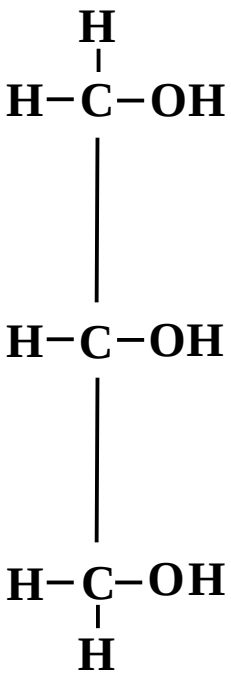
FATTY ACID

FATTY ACID

FATTY ACID

# FATS/OILS STRUCTURE

FA
*
BD



BOND FATTY ACID

BOND FATTY ACID

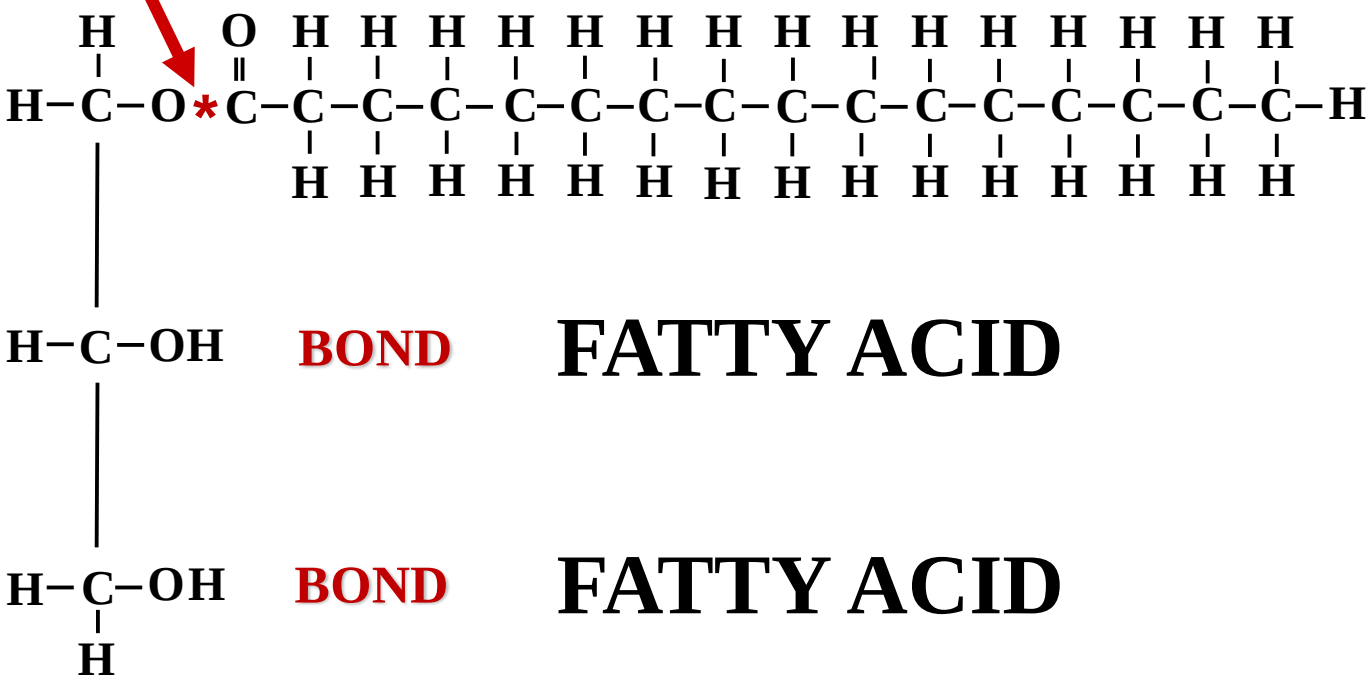
BOND FATTY ACID

GLYCEROL

# FATS/OILS STRUCTURE

FA
*
BD

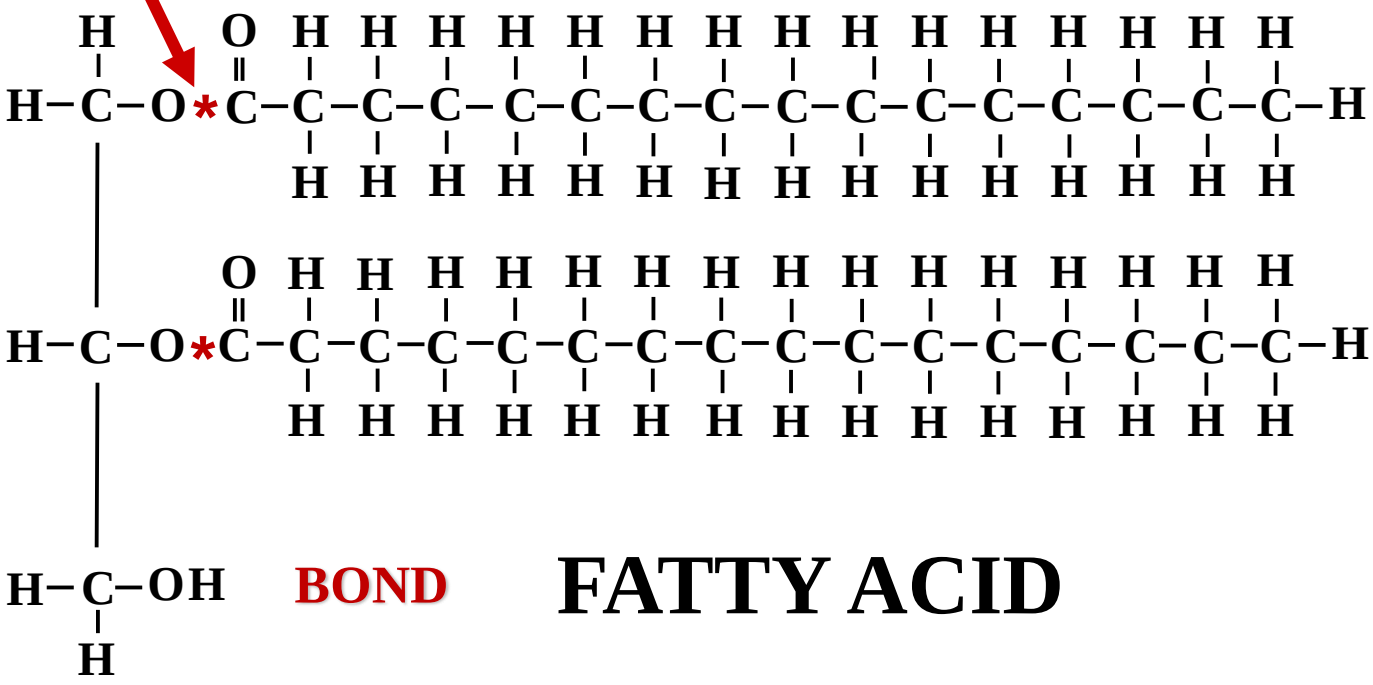
BOND



# FATS/OILS STRUCTURE

FA
*
BD

BOND

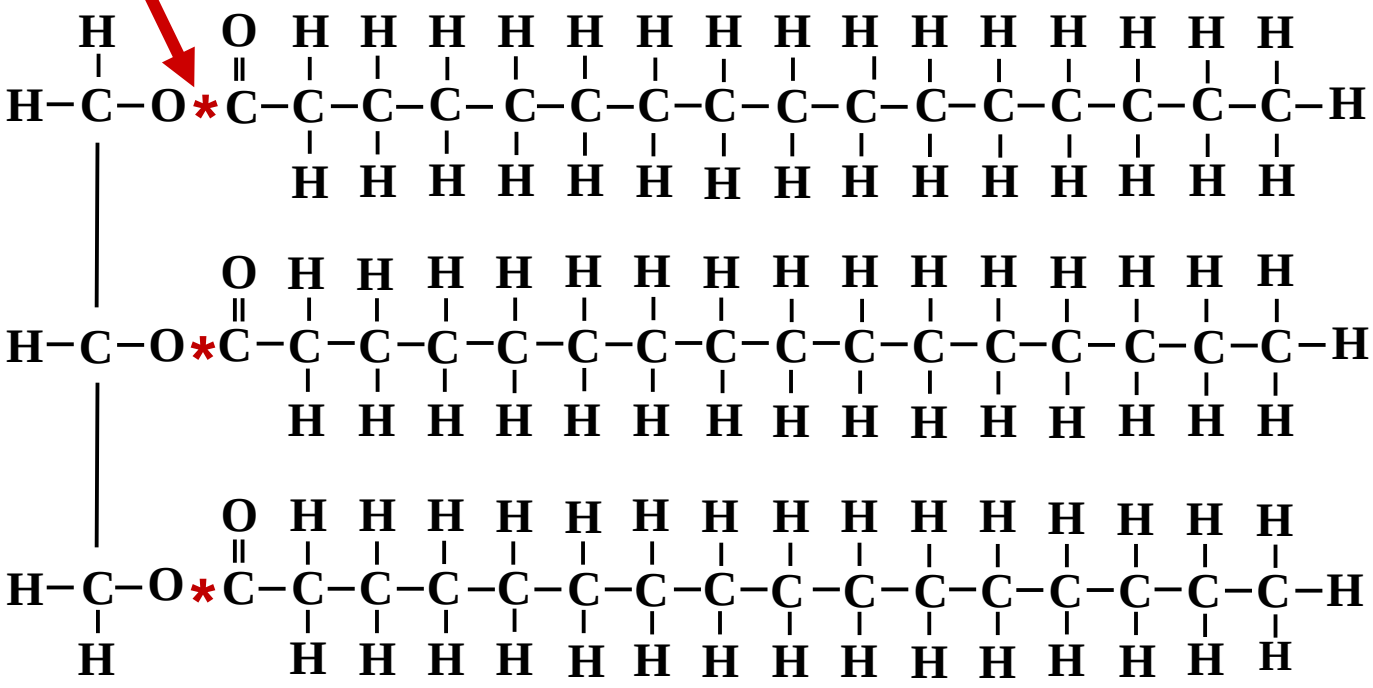



GLYCEROL

# FATS/OILS STRUCTURE

EB

**BOND**



**FATTY ACID**

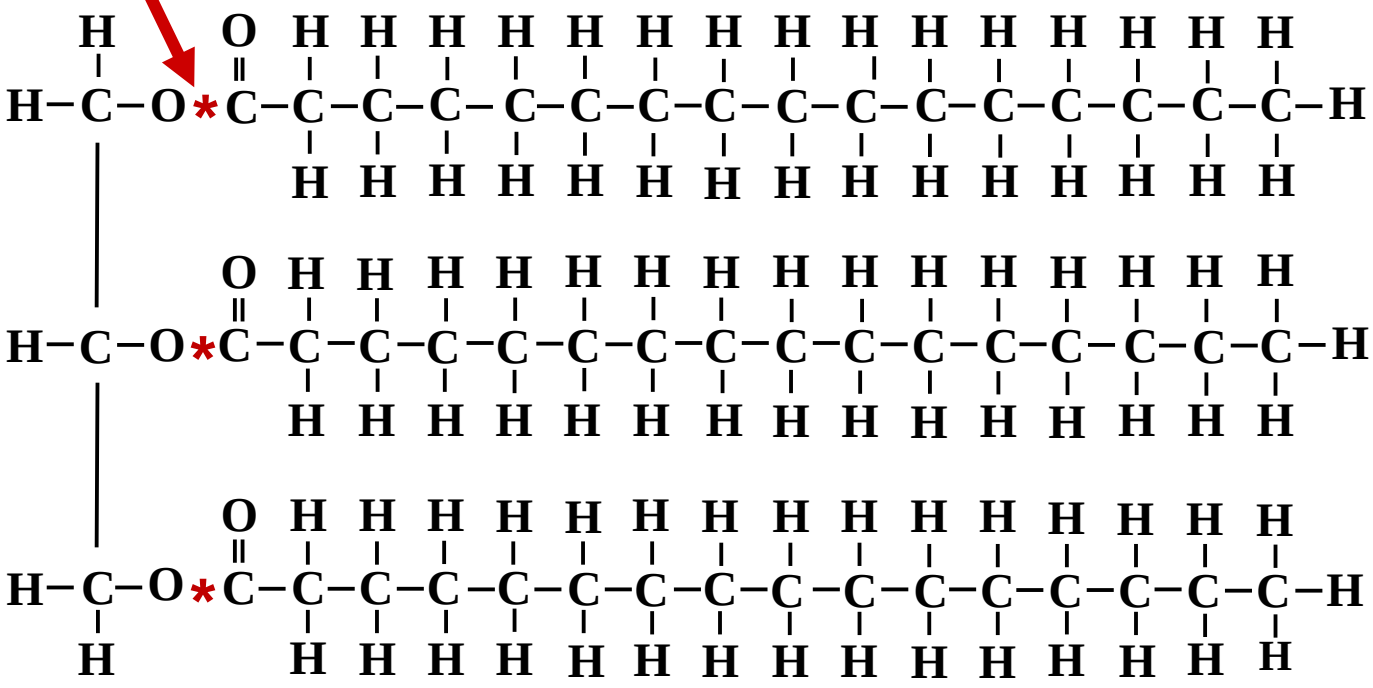
**FATTY ACID**

**FATTY ACID**

**GLYCEROL**

# FATS/OILS STRUCTURE

**ESTER BOND**



**FATTY ACID**

**FATTY ACID**

**FATTY ACID**

**GLYCEROL**

**ESTER BOND LINKS GLYCEROL & FATTY ACIDS**

E

# ESTER BOND

# ESTER BOND

# ESTER BOND

# COVALENT BOND

# ESTER BOND

# ESTER BOND

# COVALENT BOND

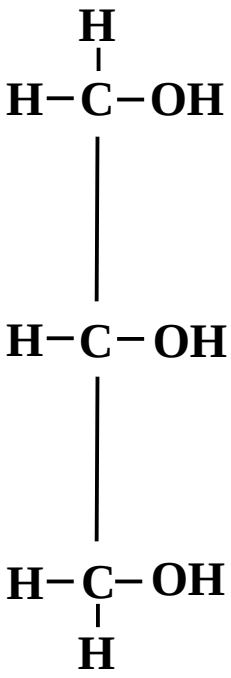
# ---

# FORMED VIA OH & COOH INTERACTION

# ESTER BOND

# FATS/OILS
# ESTER BOND

OH

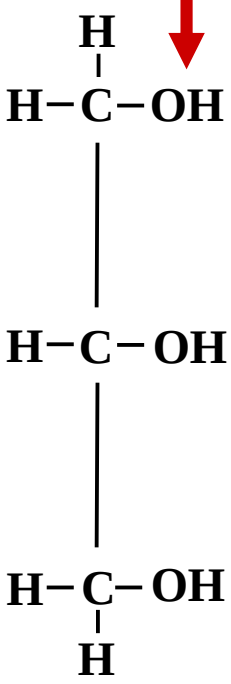


**GLYCEROL**

# FATS/OILS
# ESTER BOND

FA

HYDROXYL GROUP

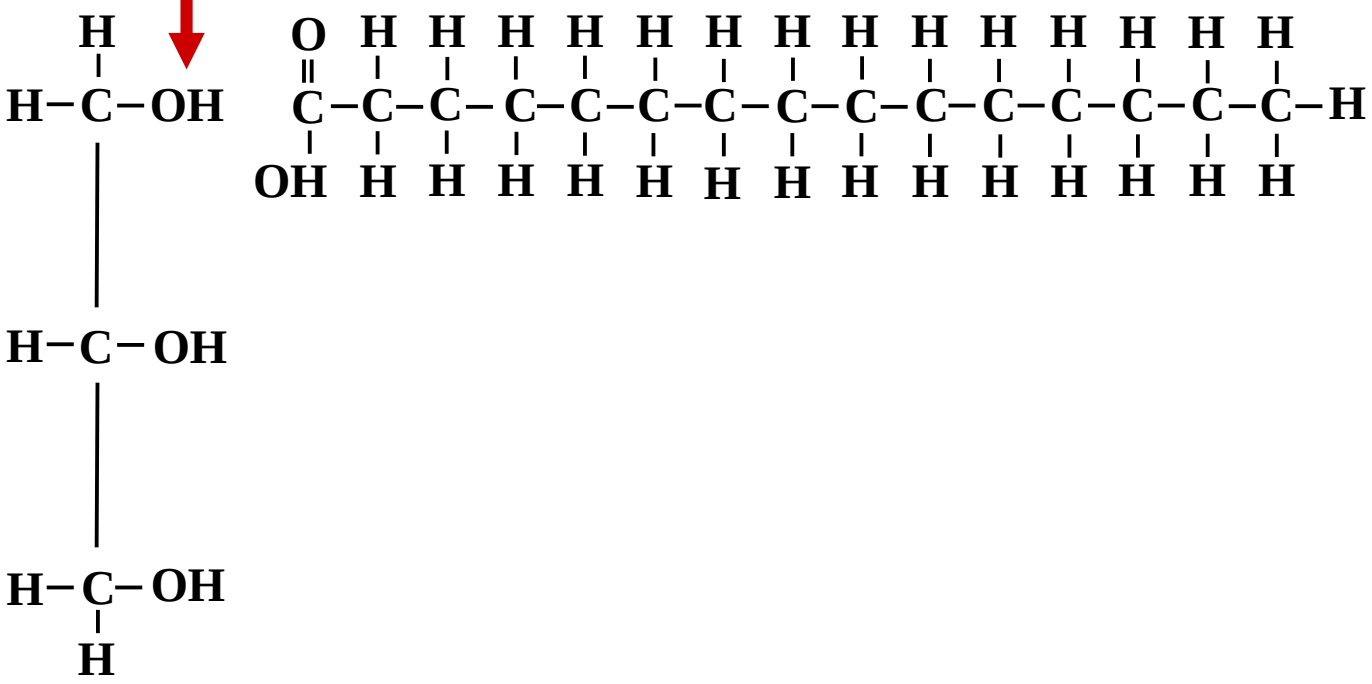


GLYCEROL

# FATS/OILS
# ESTER BOND

CG

HYDROXYL GROUP

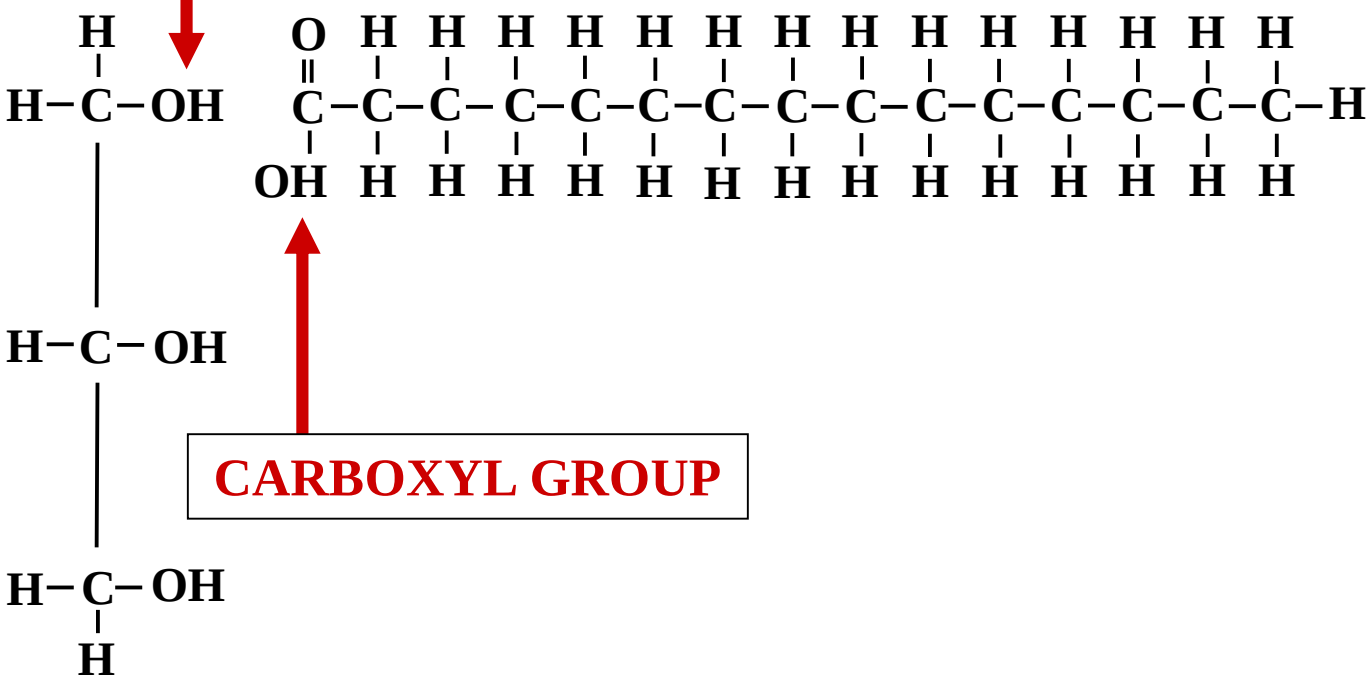


FATTY ACID

GLYCEROL

# FATS/OILS
# ESTER BOND

HYDROXYL GROUP



FATTY ACID

CARBOXYL GROUP

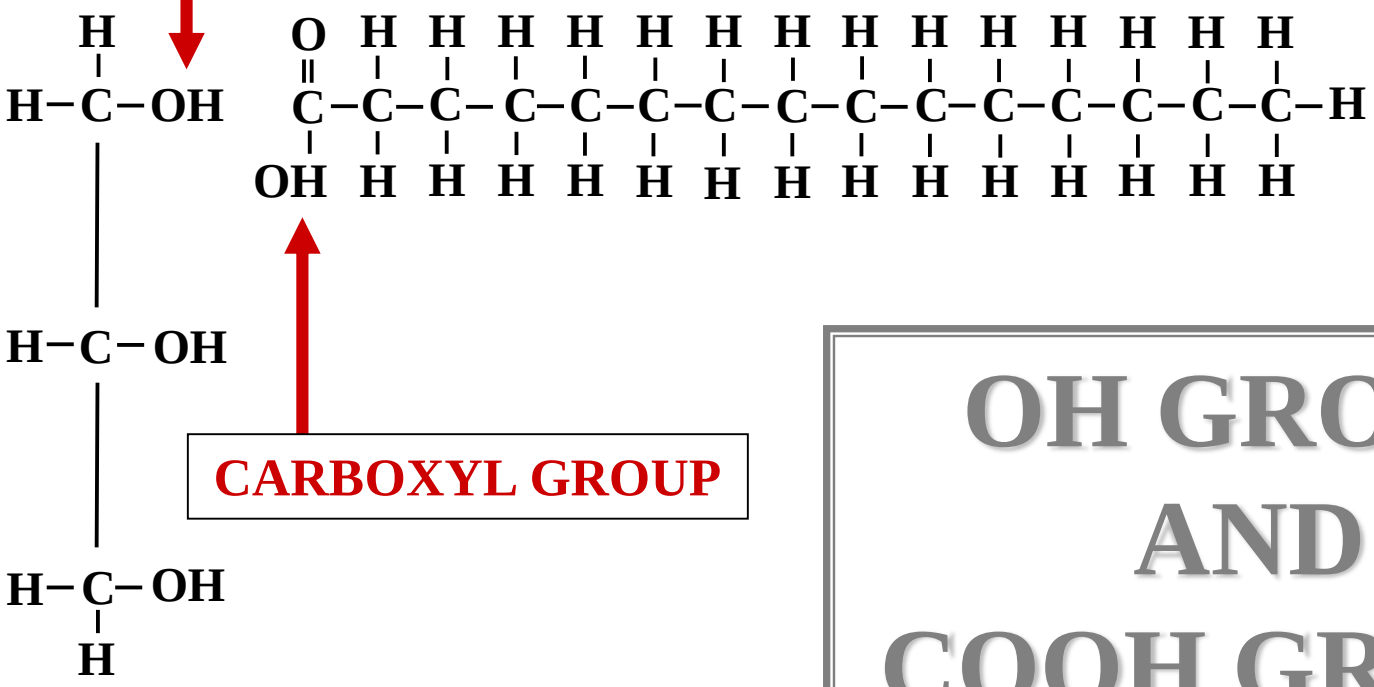
GLYCEROL

# FATS/OILS
# ESTER BOND

?

C

HYDROXYL GROUP



FATTY ACID

CARBOXYL GROUP

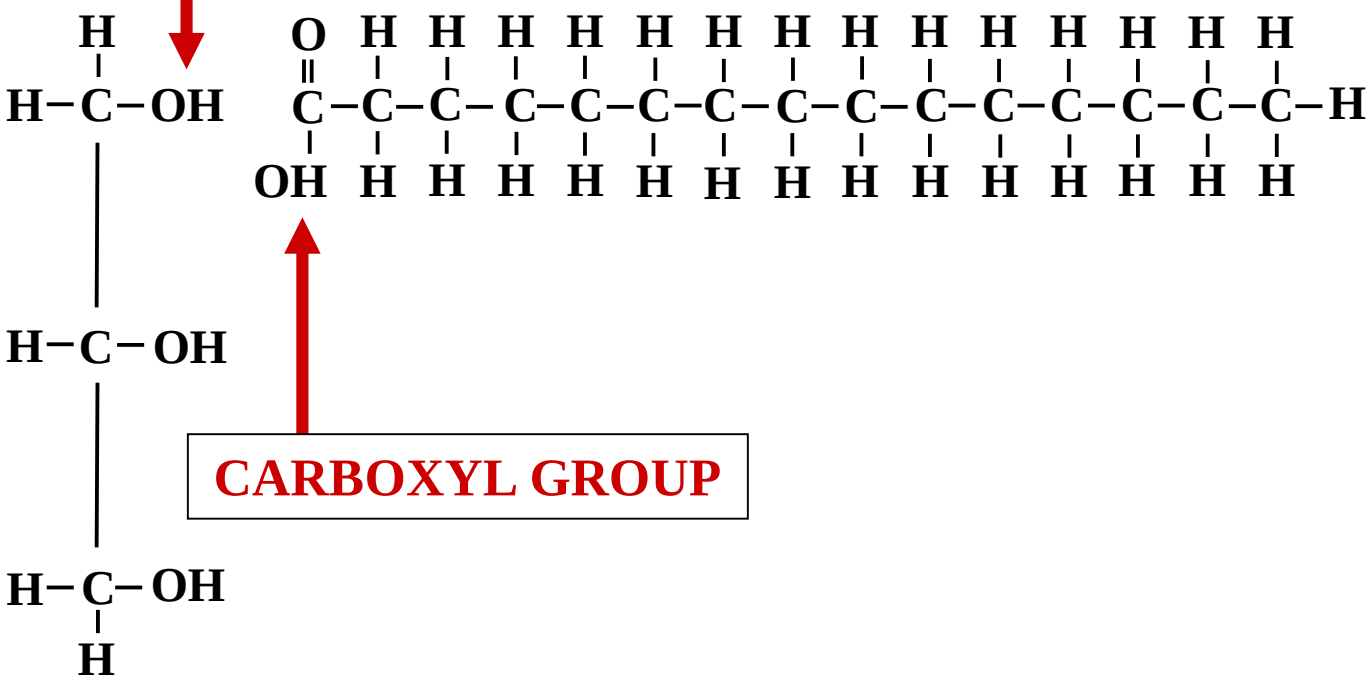
GLYCEROL

OH GROUP AND COOH GROUP INTERACT

# FATS/OILS
# ESTER BOND

C

HYDROXYL GROUP



FATTY ACID

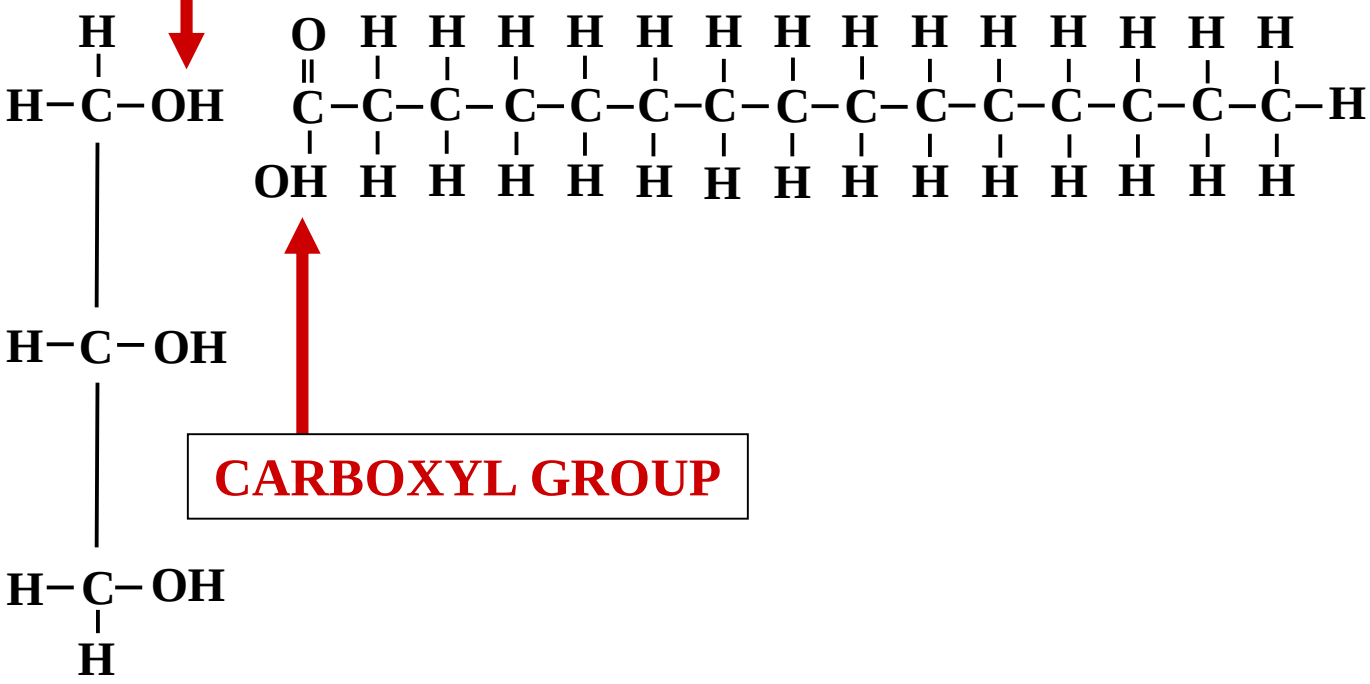
CARBOXYL GROUP

GLYCEROL

? REACTION

# FATS/OILS
# ESTER BOND

HYDROXYL GROUP



FATTY ACID

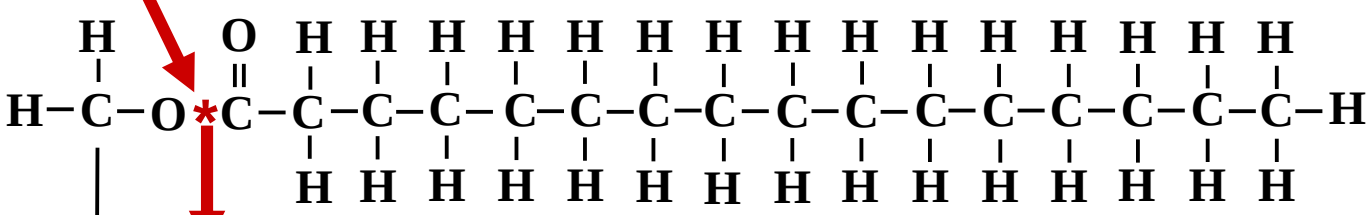
CARBOXYL GROUP

GLYCEROL

CONDENSATION REACTION

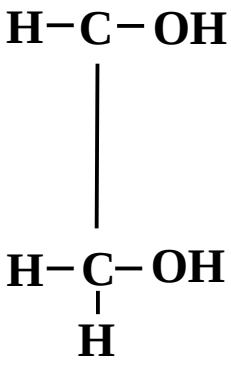
# FATS/OILS
# ESTER BOND

**BOND**



**FATTY ACID**

**? DERIVED**



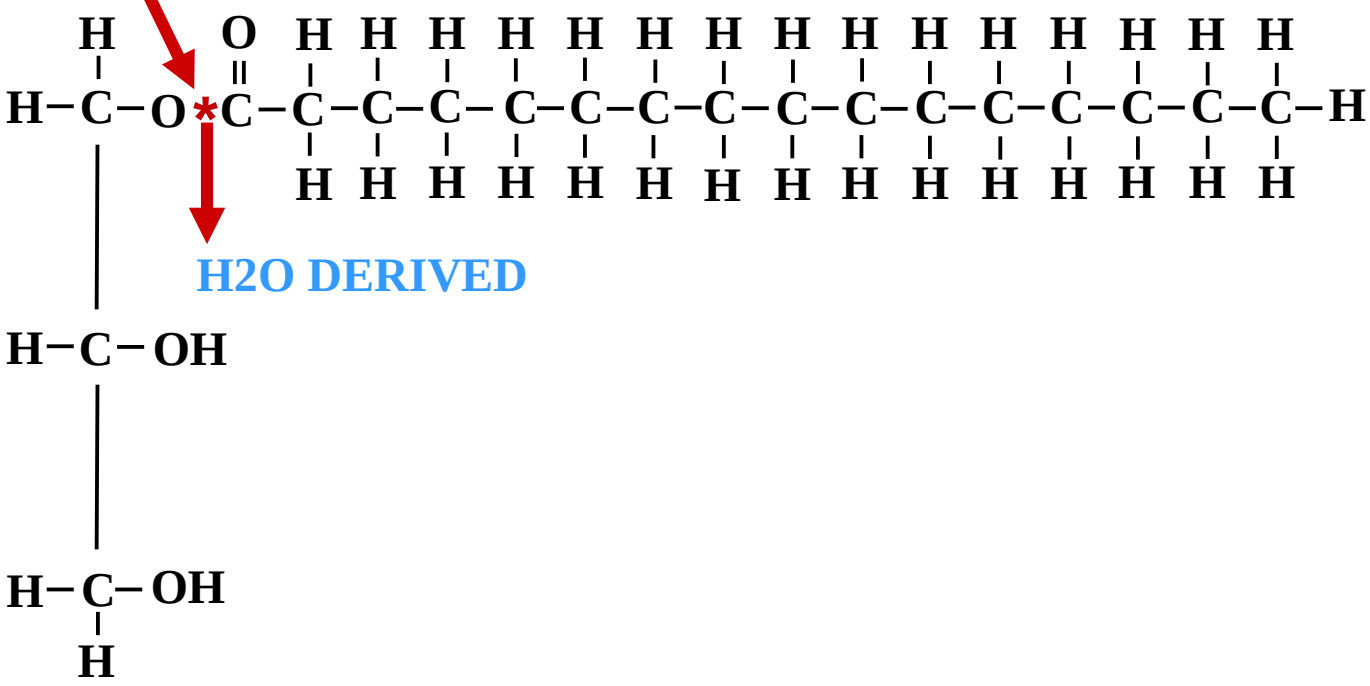
**GLYCEROL**

**CONDENSATION REACTION**

# FATS/OILS
# ESTER BOND

?B

**BOND**




**FATTY ACID**

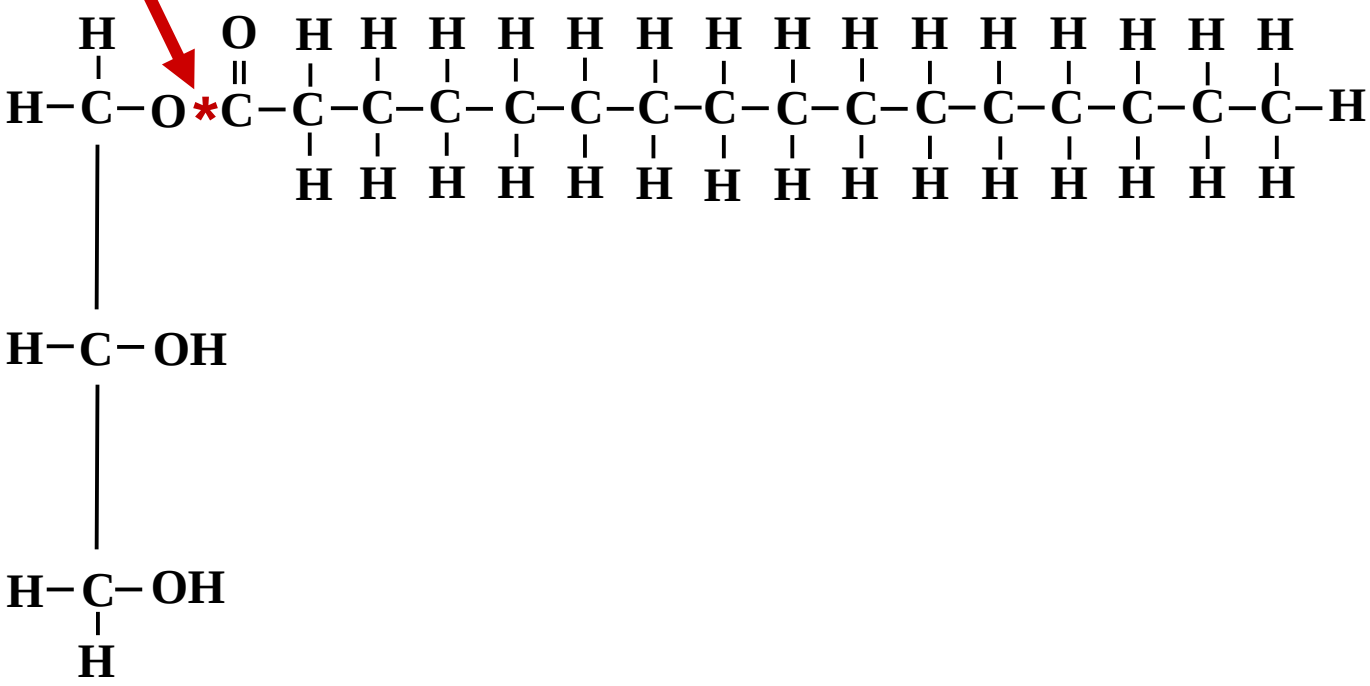
**GLYCEROL**

**CONDENSATION REACTION**

# FATS/OILS
# ESTER BOND

EB

? BOND



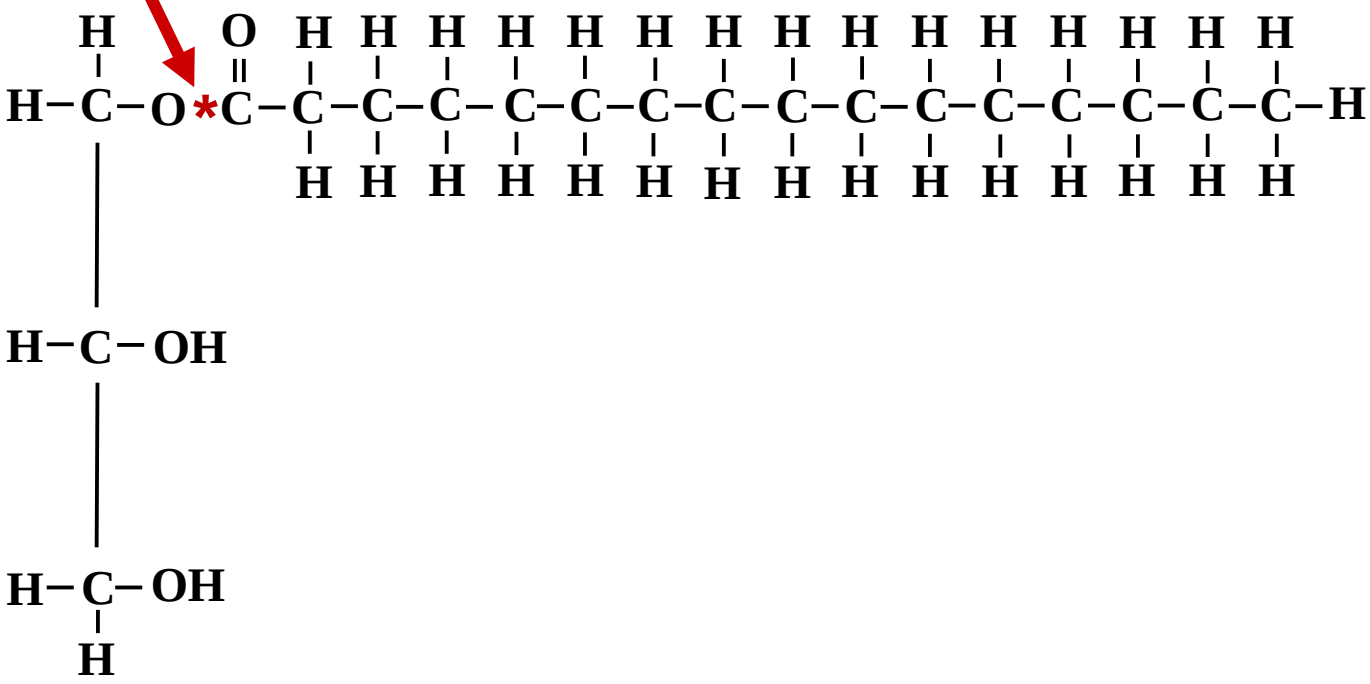
FATTY ACID

GLYCEROL

CONDENSATION REACTION

# FATS/OILS
# ESTER BOND

**ESTER BOND**



**FATTY ACID**

**GLYCEROL**

**CONDENSATION REACTION**