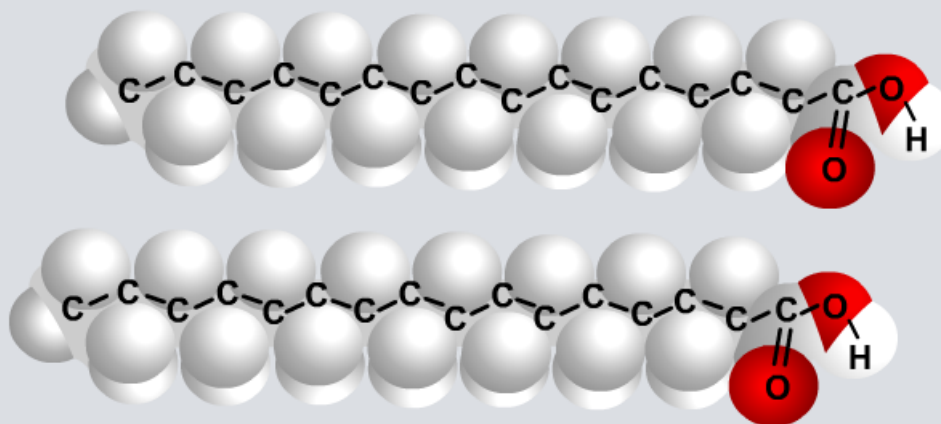


# Hydrogenation



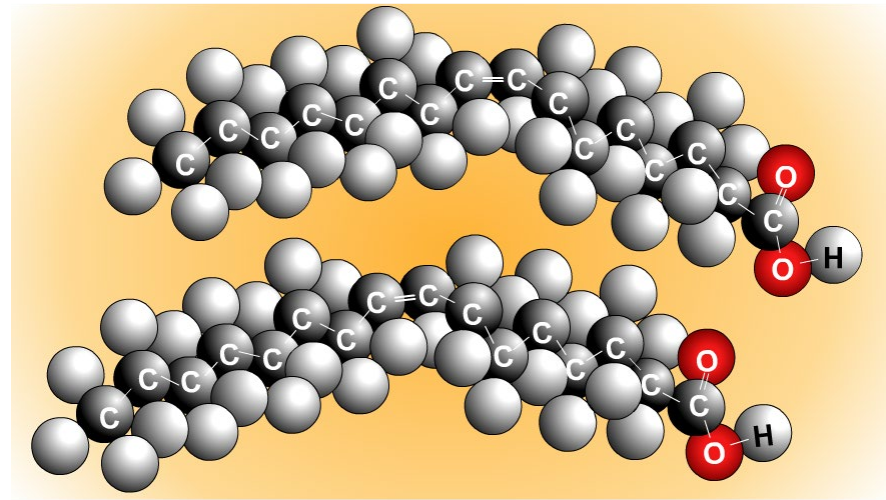
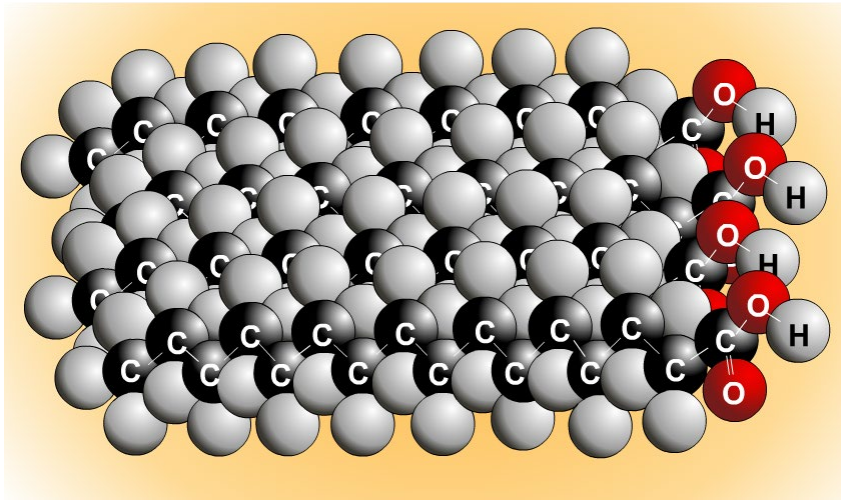
# Chemistry of fats and oils



# What are the differences between fats?

**Saturated fats** contain no carbon-to-carbon double bonds. The straight fatty acid chains pack closely together.

**Unsaturated fats** contain at least one carbon-to-carbon double bond. This bends the fatty acid chains and they cannot pack closely together.



Saturated fats are less healthy than unsaturated fats because the dense packing makes them harder for the body to digest.

# Testing for double bonds



# How is margarine made?

Margarine was originally made using buttermilk.

Most modern margarines are made from plant oils. The oil is heated and hydrogen is pumped through it. This is called **hydrogenation** – an **addition reaction**.



Some of the carbon-to-carbon double bonds in the plant oils are broken and extra hydrogen atoms are added. This hardens the oil to make it a solid at room temperature.

Not all the carbon-to-carbon double bonds are broken. This means that margarines still contain unsaturated fats. The oil is **partially hydrogenated**.

Nickel is used as a catalyst for this reaction. It is filtered out before the margarine is packaged and sold.

## The Rise, Fall and Rise Again of Margarine

Margarine was first made in the 19th century. Today, hundreds of different types are sold around the world.

Initially made from dairy products, most margarines are now made from plant oils.

Click "**start**" to find out about margarine's journey from peasant food to miracle spread.



**start**

