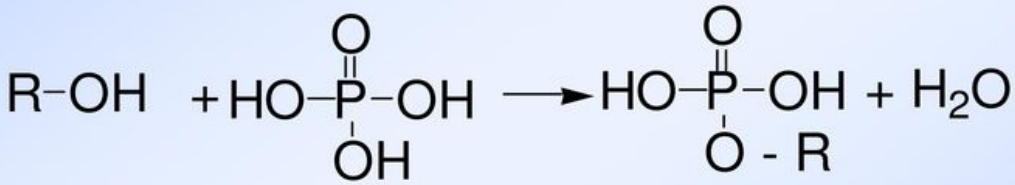
Esterification

The most important biological esters of carbohydrates are phosphate esters.



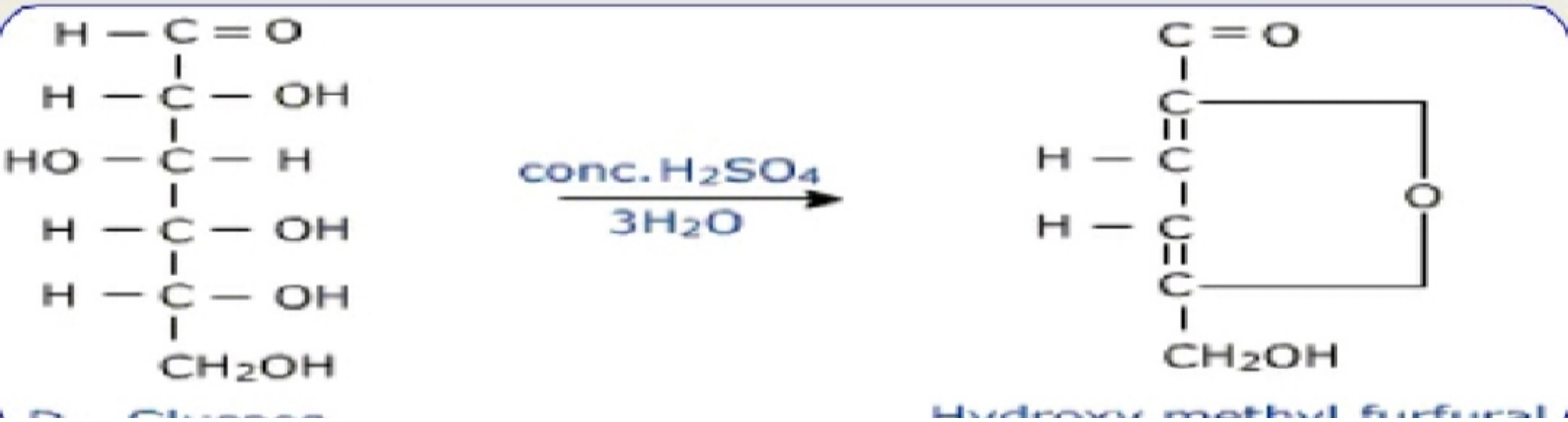
Example. Phosphoryl group from ATP forms an ester with D-glucose, catalyzed by kinases.

$$\text{D-glucose + ATP} \overset{\text{kinase}}{\rightleftharpoons} \text{D-glucose-6-phosphate + ADP}$$

Furfural formation

- Monosaccharides when treated with concentrated H_2SO_4 undergoes dehydration with the removal of 3 molecules of water.
- Hexoses give hydroxymethyl furfural and pentoses give furfural.
- Furfurals condense with phenolic compounds to give various colors.

  E.g. Molisch's test: General test for carbohydrates (H_2SO_4 and α-naphthol)
- Rapid Furfural and Seliwanoff's test: Tests for presence of keto group



TEST FOR PENTOSES

Sugar solution

Equal Volume of Hcl containing little Phloroglucinol

Red Color

OSAZONE FORMATION TEST

Sugar solution

+

Phenyl hydrazine Hydrochloride

+

Sodium acetate

+

Acetic acid

Yellow Crystals

REDUCTION OF FEHLINGS SOLUTION

Solution of Carbohydrate

+

Equal Quantities of Fehling's solution A&B

△ →

Brick Red Precipitate

MOLISCH'S TEST

Compound

+

conc.H_2SO_4

+

α- napthol

Purple colored ring (at junction of two phases)