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Chemistry

SUB. CODE- BSCC2402

For B.Sc. 4th Semester

(Heterocycles)

Module-III

Furfural and Furoic acid

By

Dr. Rosy Mallik

Assistant Professor,

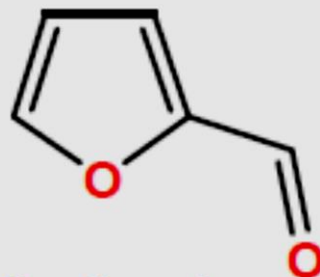
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Furfural : Occurrences



furfural

It is found in many foods: coffee (55–255 mg/kg) and whole grain bread (26 mg/kg).

Furfural is an important renewable, non-petroleum based, chemical feedstock. It can be converted into a variety of solvents, polymers, fuels and other useful chemicals by a range of catalytic reductions.

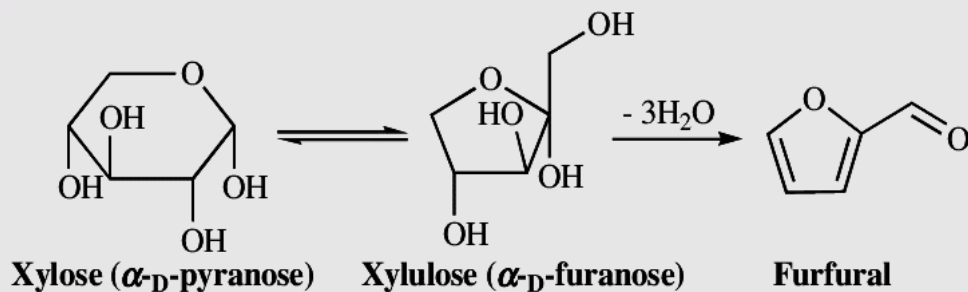
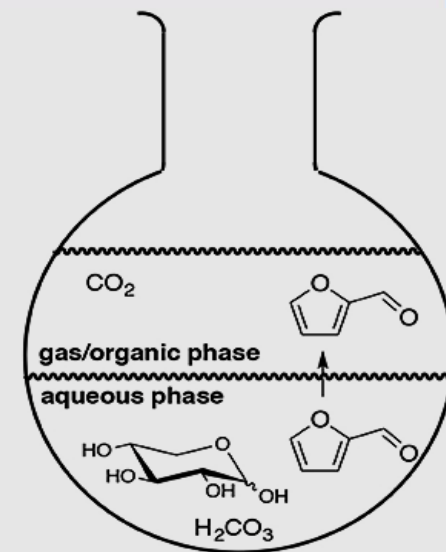
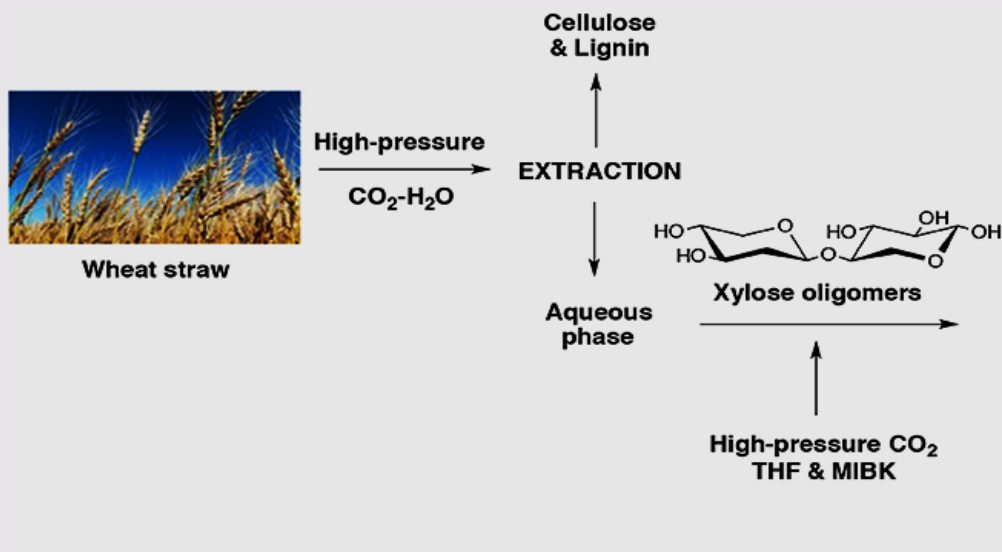


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Occurrences





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Properties

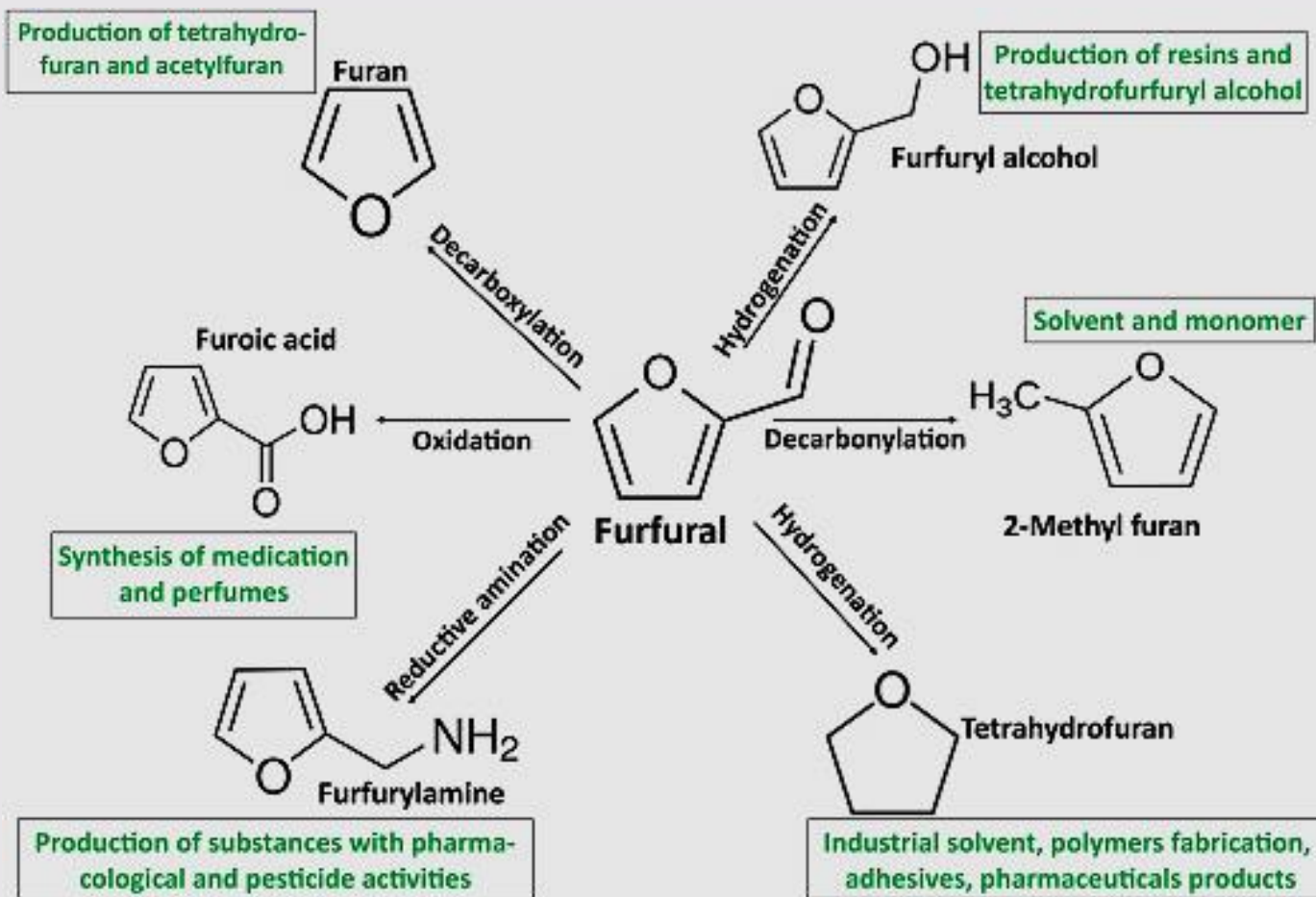
- Furfural dissolves readily in most polar **organic** solvents, but it is only slightly soluble in either **water** or **alkanes**.
- Furfural participates in the same kinds of reactions as other aldehydes and other aromatic compounds.
- It exhibits less aromatic character than **benzene**, as can be seen from the fact that furfural is readily **hydrogenated** to **tetrahydrofurfuryl alcohol**.
- When heated in the presence of acids, furfural irreversibly polymerizes, acting as a **thermosetting polymer**.



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Reactions

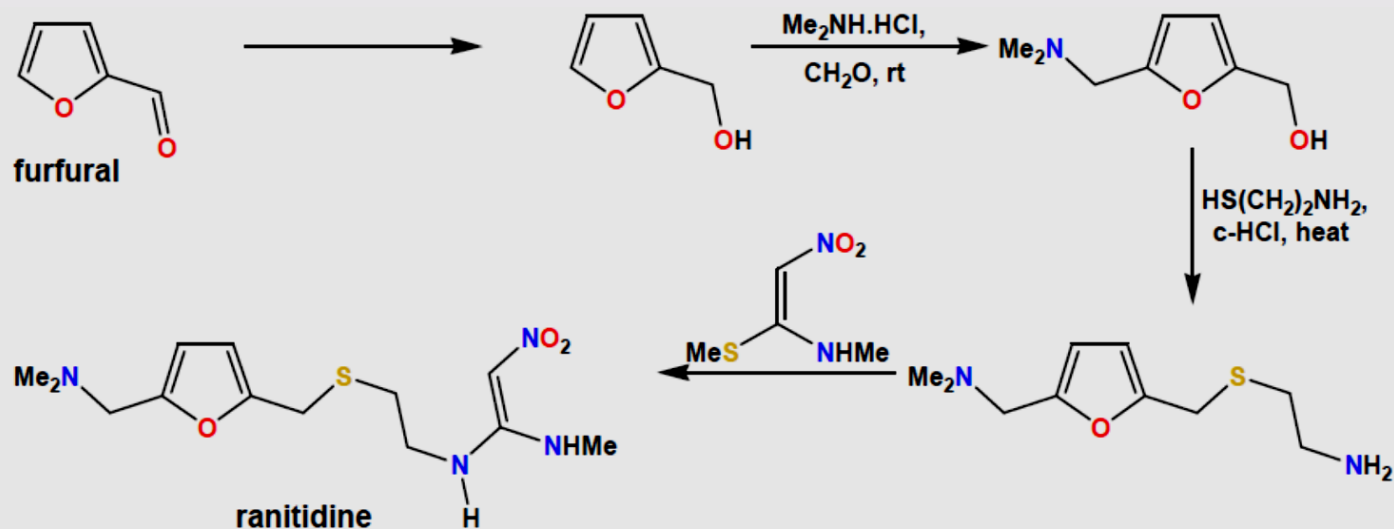




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Reactions

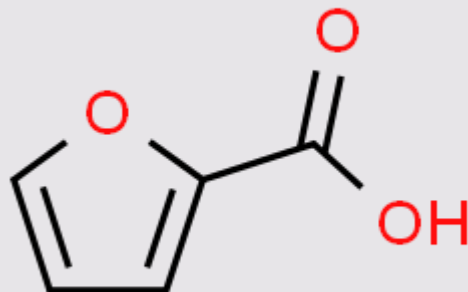




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2-Furoic acid



2-Furoic acid

2-Furoic acid most widely found in food products as a preservative and a flavoring agent. Other uses for 2-furoic acid include nylon preparation and optic technologies

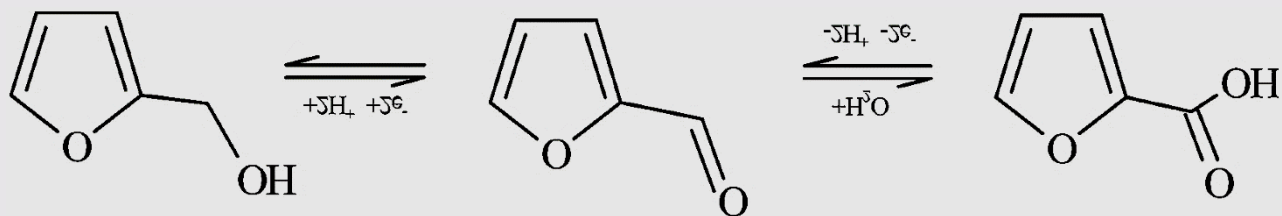
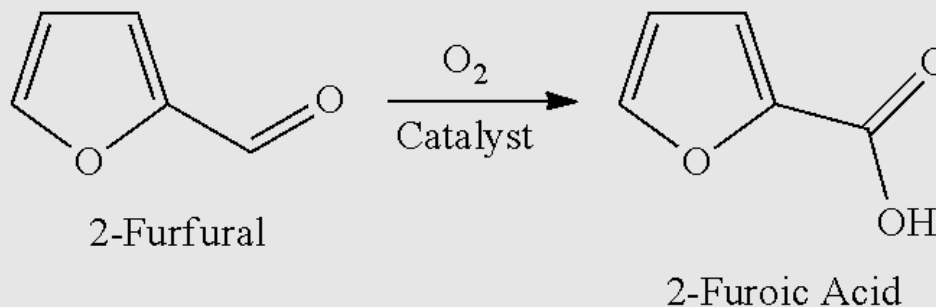


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Synthesis of 2-Furoic acid

2-Furoic acid can be synthesized by the oxidation of either furfural or furfuryl alcohol. This can be achieved either chemically or biocatalytically.



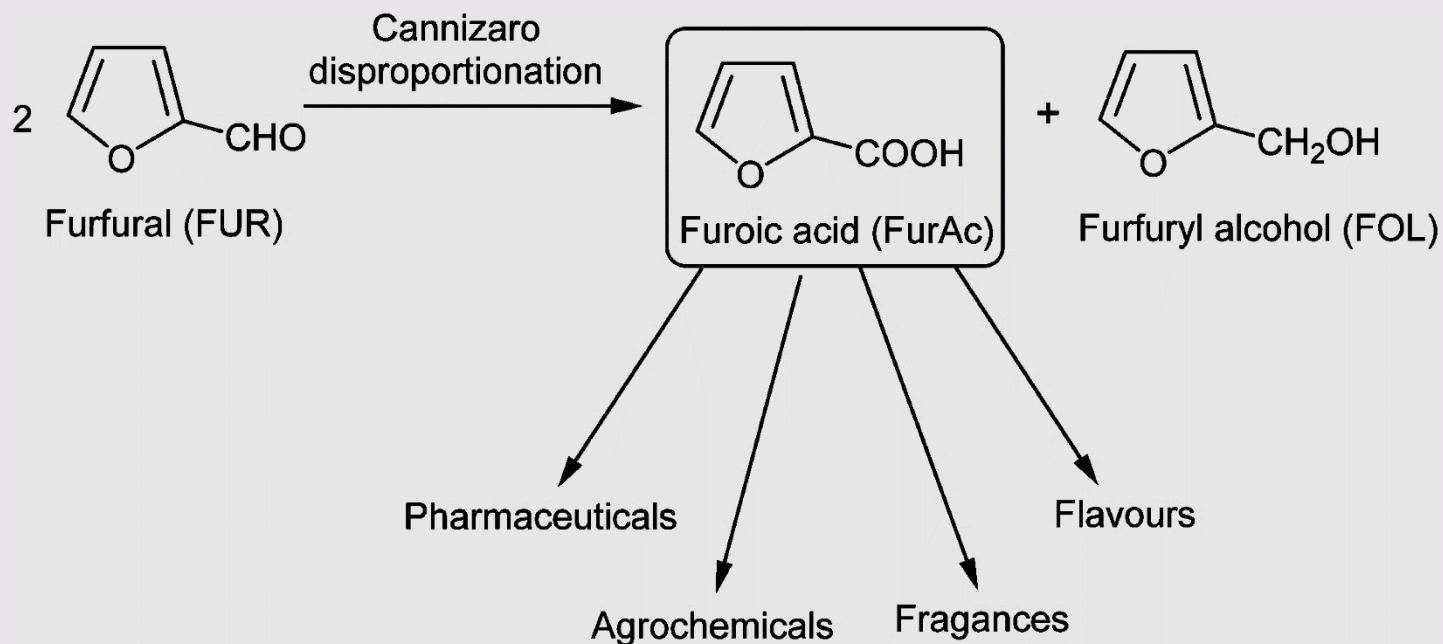


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Synthesis of 2-Furoic acid

The industrial route involves the Cannizaro reaction of furfural in an aqueous NaOH solution; this route produces both 2-furoic acid and furfuryl alcohol





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References

1. K.D Sharma and Y. R. Sharma, Kalyani Publishers, Unit-III page-278;
2. University Chemistry, Vol-IV, Dr. U. N. Dash, Dr. KK. Ojha, Himalaya Publishing house, Unit IV, page-358