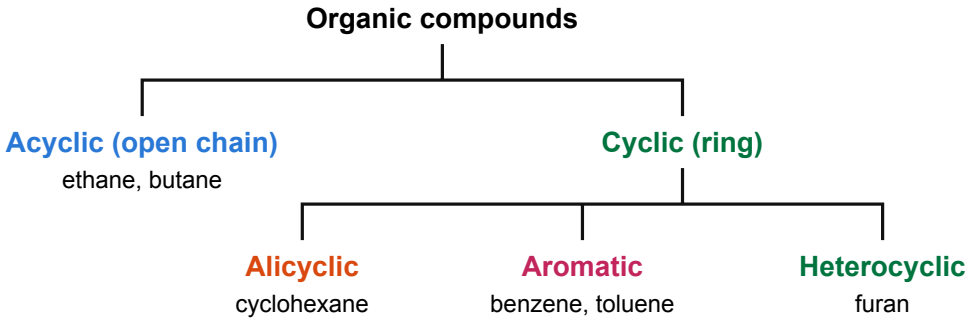
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Classifying Organic Compounds

There are millions of organic compounds. Sort them by the carbon skeleton first, then by the functional group.



1. Open chain or ring?

- **Acyclic (open-chain):** the carbon chain does not close. Also called aliphatic. Examples: ethane, butane, 2-methylpropane, ethanal.
- **Cyclic (ring):** the chain closes into a ring.

2. What kind of ring?

Type	What it means	Examples
Alicyclic	A ring of carbon atoms, with properties like aliphatic compounds	Cyclopropane, cyclohexane, cyclohexene
Aromatic	Benzene and compounds with a benzene ring	Benzene, toluene
Heterocyclic	The ring holds an atom other than carbon, such as O, N or S	Furan, thiophene, pyridine, tetrahydrofuran

Careful: a branch does not make a ring. A double bond does not make a ring aromatic. Furan, thiophene and pyridine are heterocyclic and also aromatic; tetrahydrofuran is heterocyclic but not aromatic.

Solved example

Q. Sort these: 2-methylpropane, cyclohexene, toluene, pyridine.
A. 2-Methylpropane is acyclic: its branch closes no ring. Cyclohexene is alicyclic: a carbon ring without a benzene ring. Toluene is aromatic. Pyridine is heterocyclic: nitrogen is in the ring.

Practice questions

1. (MCQ) Which is alicyclic? (a) butane (b) benzene (c) cyclopropane (d) furan

2. (Very short) Give another name for open-chain compounds.
3. (Very short) Which atom makes furan heterocyclic?
4. (Short) Why is cyclohexene not aromatic?
5. (Short) Is ethanal cyclic or acyclic? Why?
6. (Short) Name one heterocyclic compound with nitrogen in its ring.

Answer key

1. (c).
2. Aliphatic compounds.
3. Oxygen.
4. It has a carbon ring, but not a benzene ring.
5. Acyclic: its chain does not close into a ring.
6. Pyridine.

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