

## 1.5: Halogens

### Learning Objective

- How to name halogenated hydrocarbons

The **halogens** are elements belonging to Group 7A. **Fluorine, chlorine, bromine, and iodine** can be added to hydrocarbons through reactions with their **diatomic forms** or when bound to hydrogen as **hydrogen halides**.



Figure 1.5.1. where X is any halogen atom: Diatomic halogen vs halogen halide

When a halogen atom is bound to an otherwise saturated carbon atom, the molecule is known as an **alkyl halide**.

Substituent	Symbol	Name
Fluorine	Fl	fluoro-
Chlorine	Cl	chloro-
Bromine	Br	bromo-
Iodine	I	iodo-

When naming molecules according to the IUPAC system of nomenclature, remember **prefix-parent-suffix** (like un-believe-able).

- prefix:** what are the substituents?
- parent:** how many carbons?
- suffix:** what is the family of compounds?

### Practice Questions

1. This molecule is named 2-chlorobutane.

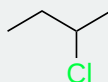


Figure 1.5.2: 2-chlorobutane

What is the name of Molecule A?

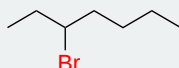


Figure 1.5.3: Molecule A

2. This molecule is named 2-fluoro-3-methylpentane.

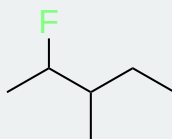


Figure 1.5.4: 2-fluoro-3-methylpentane

This molecule is named 4-iodo-2-methylhexane.

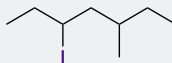


Figure 1.5.5: 4-iodo-2-methylhexane

What is the name of Molecule B?

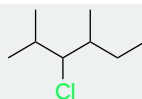


Figure 1.5.6: Molecule B

3. This molecule is named 1-chloro-2-butene.

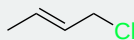


Figure 1.5.7: 1-chloro-2-butene

This molecule is named 5-fluoro-2-hexene.

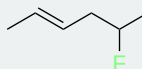


Figure 1.5.8: 5-fluoro-2-hexene

What is the name of Molecule C?

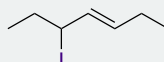


Figure 1.5.9: Molecule C

4. This molecule is named 5-fluoro-1,3-cyclohexadiene.

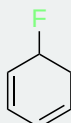


Figure 1.5.10: 5-fluoro-1,3-cyclohexadiene

What is the name of Molecule D?

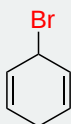


Figure 1.5.11: Molecule D

5. Write the steps that you use to name an alkyl halide, in order, as instructions for a student who doesn't know how to do it.

6. Draw any alkyl halide and go through the steps in naming your molecule.

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