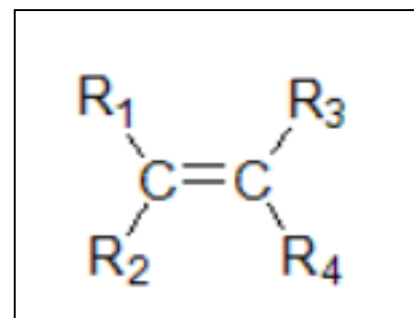


Lesson 4 Naming cis and trans isomers and writing their semistructural formulae

[Click](#) to revise cis and trans isomers

[Click](#) to revise structural and semistructural formulae

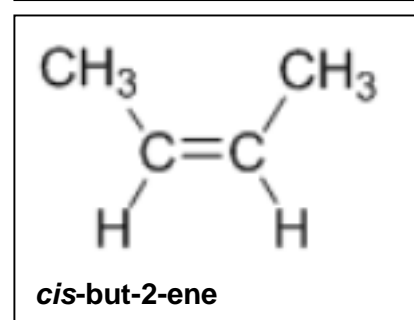
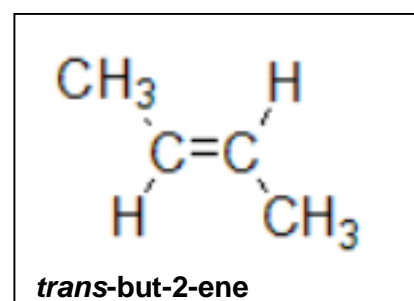
An alkene can exist as *cis* and *trans* isomers *only* if R_1 is not equal to R_2 and R_3 is not equal to R_4



cis- if the two alkyl groups, R-, are on the same side of the C=C

trans- if the two alkyl groups, R-, are on opposite sides of the C=C.

the terms ***cis*** and ***trans*** are inserted into the name as prefixes.

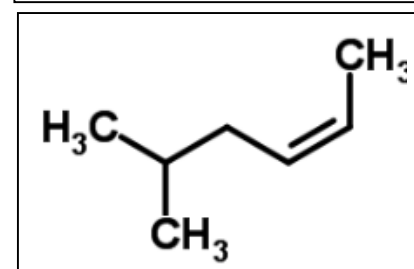


Example 1

Name the molecule shown on the right.

This molecule is a *cis* isomer of 5-methylhex-2-ene

We write the name with the *cis* prefix ***cis*-5-methylhex-2-ene**. The semi-structural formula is given as ***CH₃CH(CH₃)CH₂CHCHCH₃***.

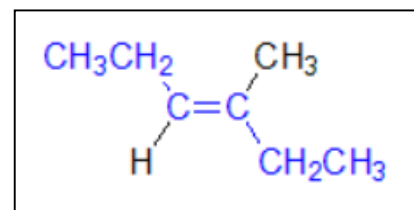


Example 2

Name the molecule shown on the right.

This molecule is a *trans* isomer of 3-methylhex-3-ene

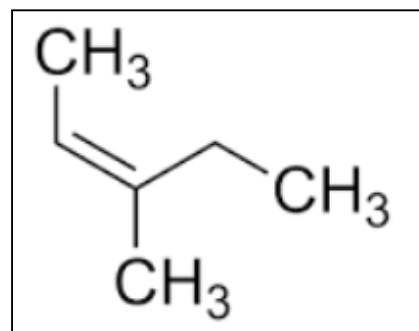
We write the name with the *trans* prefix ***trans*-3-methylhex-3-ene**. The semi-structural formula is given as ***CH₃CH₂CHC(CH₃)CH₂CH₃***



1) Name the molecules shown on the right and give their semistructural formulae

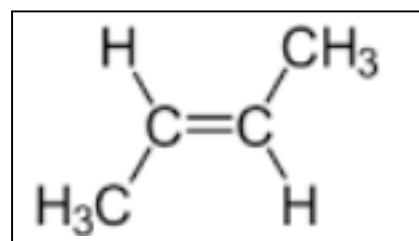
a) *trans-3-methylpent-2-ene*

$\text{CH}_3\text{CH}(\text{CH}_3)\text{CH}_2\text{CH}_3$



b) *trans-but-2-ene*

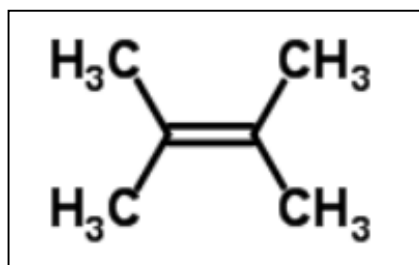
$\text{CH}_3\text{CHCHCH}_3$



c) *2,3-dimethylbut-2-ene*

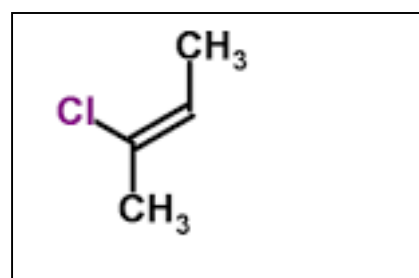
No isomers exist so there is no need to specify cis or trans.

$\text{CH}_3\text{C}(\text{CH}_3)\text{C}(\text{CH}_3)\text{CH}_3$



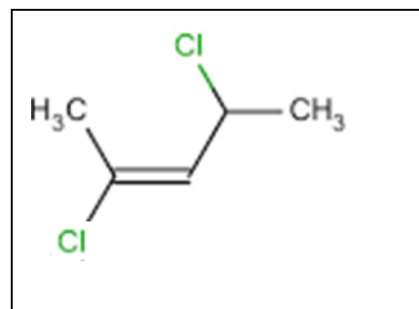
d) *trans-2-chlorobut-2-ene*

$\text{CH}_3\text{CClCHCH}_3$



e) *cis-2,4-dichloropent-2-ene*

$\text{CH}_3\text{CClCHClCH}_2\text{CH}_3$



f) *trans-1-chlorobut-2-ene*

$\text{CH}_3\text{CHCHCH}_2\text{Cl}$

