

Chem 233: Chapter 4 Handout

Alkyl Substituents (R):

1. obtained from alkane by removal of H
2. attached as side group to carbon backbone and substitutes for a H.
3. parent alkane “-ane” ending becomes “-yl”. Ex. pentane becomes pentyl-.

<u>Alkyl Substituent (R)</u>	<u>Name</u>
-CH ₃ (or -Me)	methyl
-CH ₂ CH ₃ (or -Et)	ethyl
-CH ₂ CH ₂ CH ₃ (or -Pr)	propyl
CH ₃ CHCH ₃ (or - <i>i</i> -Pr)	isopropyl
 -CH ₂ CH ₂ CH ₂ CH ₃	butyl
CH ₃ CHCH ₂ CH ₃	<i>sec</i> -butyl (or <i>s</i> -butyl)
 (CH ₃) ₂ CHCH ₂ -	isobutyl
(CH ₃) ₃ C-	<i>tert</i> -butyl (or <i>t</i> -butyl)
-F, -Cl, -Br, -I	fluoro, chloro, bromo, iodo

Nomenclature of Alkanes

IUPAC Rules Summarized:

1. **Find longest continuous carbon chain and name as alkane.** If two equal length chains are present, choose the chain with most branches (i.e. smallest side groups).
NOTE: Eventually will learn that alkane (“-ane”) ending will change according to presence of specific functional group. Ex. hexane becomes hexanol if alcohol functional group is present.
2. **Name substituents.**
3. **Number substituents.** Place number in front of substituent name separated by a dash.
NOTE: First, number carbons in longest chain such that first substituent has lowest number. Second, and if two substituents have same lowest number, number from end that gives second lowest number (e.g., 2, 3, 5, better than 2, 4, 5).
4. **Add Greek prefixes (di-, tri-, tetra-, penta-.....) to substituent name** indicating how many of each substituent present.
5. **List substituents in alphabetical order followed by alkane name.** Do not include Greek prefixes (di-, tri- etc.) and *sec-/tert-* designations in alphabetization but do include iso in alphabetization. Numbers are separated with commas; numbers and names are separated with dashes.

Substituents (with numbers/prefixes) + Parent Alkane (change ending -ane ending when change f.g.)