**3 Steps to Organic Nomenclature**

1. Identify the functional group



Note: -OH, it’s an alcohol, so parent chain will end with -ol

1. Find the parent chain (aka the longest hydrocarbon chain) that contains the functional group



Note: Long chain with the functional group, the alcohol, is highlighted in red

1. Let the functional group carbon take the lowest chain number, then assign the side chains with the lowest numbers



Note: 3 methyl group sidechains are identified at position 4, 6, 7

**IUPAC name: 4, 6, 7-trimethylnonan-2-ol**

Use comma “,” to separate the numbers

Use hyphen “-“ to separate numbers and letter

Parent chain tells you a) it’s a 9 carbon chain, and b) the functional group is in the 2 position

This tells you there are 3 methyl groups at the 4, 6, and 7 positions**. DON’T forget tri** to indicate there are 3 of them.

More examples:

|  |  |  |
| --- | --- | --- |
| An Aldehyde (parent chain ends with –al) | 8 Carbons | **3,5,6-trimethyloctanal**(The 1 in 3,5,6-trimethyloctan-1-al won’t be necessary) |
| A Ketone (parent chain ends with –one) | 7 Carbons with C=O in the 2 position | **4,5-dichloroheptan-2-one** |
| An Amine (parent chain ends with –amine) | 7 Carbons with –NH2 in the 2 position | **3,4,5-trimethylheptan-2-amine** |
| An Carboxylic Acid (parent chain ends with –oic acid) | 6 Carbons with –COOH group in the 1 position | **3,4-dibromo-5-chlorohexanoic acid** |
| An Alcohol in cyclic form (parent chain ends with –ol) | Cyclic, 6 carbons, alcohol --> Cyclohexanol | **3,4-dichloro-2-methylcyclohexanol** |
| An Amine in cyclic form (parent chain ends with -amine) | Cyclic, 8 carbons, amine --> Cyclooctanamine | **2,4,6-trimethylcyclooctanamine** |
| An Ester (parent chain ends with –oate) | 6 Carbons, ester, --> hexanoate | **ethyl 3,4-dichlorohexanoate**Note: For ester, the group (colored in blue) on oxygen goes first  |
| An Amide (parent chain ends with –amide) | 6 Carbons, amide, --> hexanamide | **3,4-dichloro-N-methylhexanamide**Note: N indicates what is on the nitrogen, and in this case it’s a methyl group. It’s easier to think of N as a sidechain number |
| An Amide (parent chain ends with –amide) | 7 Carbons, amide, --> heptanamide  | **3,4-dibromo-N-ethyl-N-methylheptanamide**Note: there are two groups on the nitrogen, that’s why it’s N-ethyl and N-methyl |

**Common mistakes:**

1. Missing the carbon on C=O

|  |  |
| --- | --- |
| Wrong assignment | Correct assignment |

1. Wrong parent chain

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| --- | --- |
| Wrong assignment | Correct assignment |

1. Forgetting the di tri tetra penta…



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| --- | --- |
| Wrong name: 2,3,4,6-ethylphenol | Correct name: 2,3,4,6-**tetra**ethylphenol |



Nomenclature practice problems:

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|  |  |  | Hint: -OH would be a sidechain in this case and it’s called “hydroxyl” |
|  |  |  |  |

Answers (not in order)

2-ethylhexanal, 5-hydroxy-6-methylheptanal, 4,5-dichloro-2-methyloctan-3-ol, *N,N*-diethylpentanamide, 2-chloro-6-ethylphenol, 2,3-dichloro-4-methylphenol, *N*-ethyl-3,4-dimethylpentanamide, 3-chlorobutanal, 6-chloroheptan-3-one, methyl 4-bromopentanoate, 2,4,5-trimethyloctan-3-ol, 3-chloro-2-methylcyclohexan-1-amine