

IB Summer Homework Year 2 - SL/HL
To prepare for school year 2018-2019

Happy Summer, chemists!! Your work this summer is mostly up to you (to review as you have time...obviously highly recommended), but here I want you to prepare yourself for Organic Chemistry (chapters 10 and 11, then the Option Energy in the fall) by dealing with the icky memorization part as you have LOTS of time this summer! Do what you need to do to memorize the stems and the functional groups so that you're ready to GO this fall! We'll start straight off with Organic in September!

**See you soon and have a restful summer!
Ms Klug**

1. Please read chapter 10.1 using the online SL E-book:

url: www.pearsonbacc.com/etextlogin

Username: aosrchem13

Password: IBChem2015

2. Be able to define and explain the following terms/concepts from 10.1:

- Organic chemistry: what is it, and why are we studying it?
- Homologous series and why they are important
- What is an "R" group?
- Functional groups – what are they and why do we care?
- Molecular, Structural and Condensed structural formulas – what are the differences and why are they useful?

3. Make sure you can explain trends in boiling points between organic molecules (IMFs!!!) AND that you can explain trend within homologous series of chemical and physical properties.

4. Memorize these two tables:

Number of carbon atoms in longest chain	Stem in IUPAC name	Example of compound
1	meth-	CH ₄ , methane
2	eth-	C ₂ H ₆ , ethane
3	prop-	C ₃ H ₈ , propane
4	but-	C ₄ H ₁₀ , butane
5	pent-	C ₅ H ₁₂ , pentane
6	hex-	C ₆ H ₁₄ , hexane

and keep going...

7 – hept-

8 – oct-

9 – non-

10 – dec-

and the functional groups on the next page (page 314 of your SL book)...

Rule 2: Identify the functional group

The functional group usually determines the specific ending or **suffix** to the name, which replaces the 'ane' ending in the parent *alkane*. The suffixes used for some common functional groups are shown in the table below. Note the distinction between *class*, which refers to the type of compound, and *functional group*, which refers to the site of reactivity in the molecule.

*

*

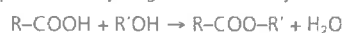
*

*

← know these! (I'd make note cards!)

Class	Functional group	Name of functional group	Suffix in IUPAC name	Example of compound	General formula
alkane			-ane	C ₂ H ₆ , ethane	C _n H _{2n+2}
alkene		alkenyl	-ene	H ₂ C=CH ₂ , ethene	C _n H _{2n}
alkyne		alkynyl	-yne	HC≡CH, ethyne	C _n H _{2n-2}
alcohol	—OH	hydroxyl	-anol	C ₂ H ₅ OH, ethanol	C _n H _{2n+1} OH
ether	R—O—R'	ether	-oxyalkane	H ₃ C—O—C ₂ H ₅ , methoxyethane	R—O—R'
aldehyde		aldehyde (carbonyl)	-anal	C ₂ H ₅ CHO, propanal	R—CHO
ketone		carbonyl	-anone	CH ₃ COCH ₃ , propanone	R—CO—R'
carboxylic acid		carboxyl	-anoic acid	C ₂ H ₅ COOH, propanoic acid	C _n H _{2n+1} COOH
ester*		ester	-anoate	C ₂ H ₅ COOCH ₃ , methyl propanoate	R—COO—R'
amide		carboxamide	-anamide	C ₂ H ₅ CONH ₂ , propanamide	
amine	—NH ₂	amine	-anamine	C ₂ H ₅ NH ₂ , ethanamine	
nitrile	—C≡N	nitrile	-anenitrile	C ₂ H ₅ CN, propanenitrile	
arene		phenyl	-benzene	C ₆ H ₅ CH ₃ , methyl benzene	

*Esters form when the alkyl group of an alcohol replaces the hydrogen of a carboxylic acid in a condensation reaction:



They are named in a similar way to salts, which form when a metal has replaced the hydrogen of a carboxylic acid. Salts take the stem of the name from the parent acid. For example, C₂H₅COONa is sodium propanoate. In esters, the alkyl group of the alcohol is the prefix, so C₂H₅COOCH₃ is methyl propanoate.

Printed by Katie Klug (kklug@aosr.org) on 6/8/2018 from 2.228.9.175 authorized to use until 9/14/2019. Use beyond the authorized user or valid subscription date represents a copyright violation.