NAMING ORGANIC COMPOUNDS: 2

1. **Carboxylic acids and their salts**

a) Draw the structures of the following compounds:

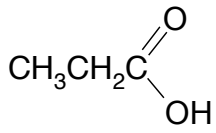
(i) ethanoic acid

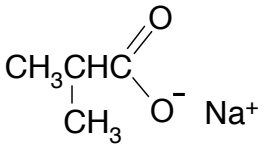
(ii) potassium ethanoate

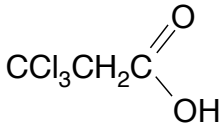
(iii) 3-chloropropanoic acid

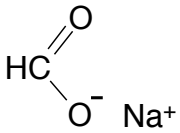
(iv) sodium 2,3-dimethylbutanoate

b) Name these compounds:

(i) 

(ii) 

(iii) 

(iv) 

2. **Esters**

a) Draw the structures of the following compounds:

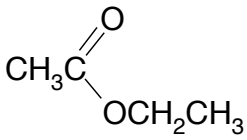
(i) methyl ethanoate

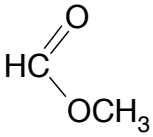
(ii) ethyl methanoate

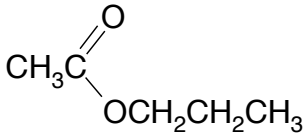
(iii) ethyl propanoate

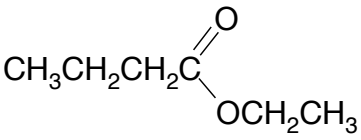
(iv) methyl 2-methylpropanoate

b) Name these compounds:

(i) 

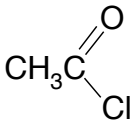
(ii) 

(iii) 

(iv) 

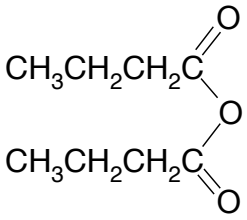
3. **Acyl chlorides**

a) Draw the structure for propanoyl chloride.

b) Name 

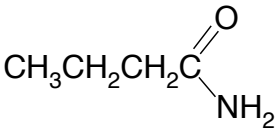
4. **Acid anhydrides**

a) Draw the structure for ethanoic anhydride.

b) Name 

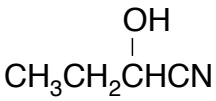
5. **Amides**

a) Draw the structure for ethanamide.

b) Name 

6. **Nitriles**

a) Draw the structure for propanenitrile

b) Name 

7. **Amines**

a) Draw the structures for

(i) ethylamine

(ii) aminoethane

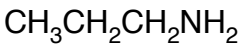
(iii) 2-aminobutane

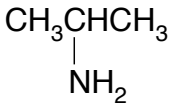
(iv) (Be careful with this one – it's new.) 1,6-diaminohexane

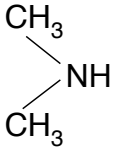
(v) diethylamine

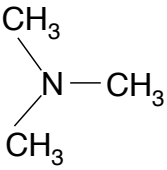
(vi) triethylamine

b) Name these compounds:

(i) 

(ii) 

(iii) 

(iv) 

8. **Amino acids**

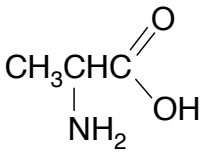
a) Draw the structures for

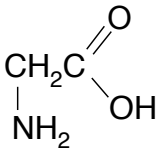
(i) 2-aminobutanoic acid

(ii) 3-aminopropanoic acid

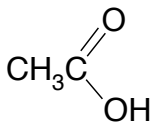
b) Name these compounds.

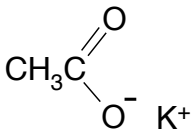
(Important: If you happen to know the biological names for some of the 2-amino acids (such as glycine, alanine and so on), you should *not* use those in answering these questions.)

(i) 

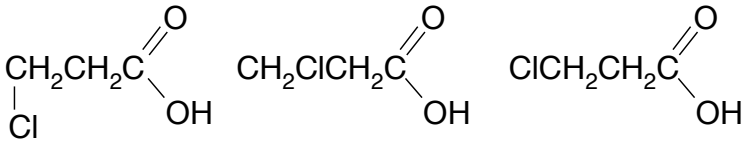
(ii) 

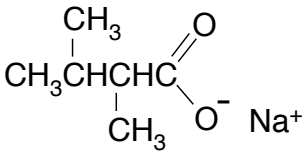
NAMING ORGANIC COMPOUNDS: 2

1. a) (i) 

(ii) 

(iii) There are various ways you could draw this, all of them are acceptable:



(iv) 

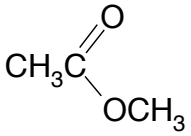
Work it out as if it was 2,3-dimethylbutanoic acid, but remember to turn it into the salt by replacing the right-hand hydrogen by an ionic bond with sodium ions. Don't leave this rather complicated example until you are sure that you can see how the structure fits the name.

b) (i) propanoic acid

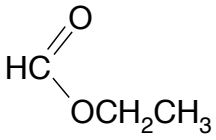
(ii) sodium 2-methylpropanoate (Work out what the acid is, and then rename it as the sodium salt of that acid.)

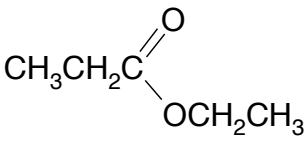
(iii) 3,3,3-trichloropropanoic acid (The numbers are essential, because the three chlorines could be shared between the two left-hand carbon atoms – as 2,2,3- or 2,3,3- as well as the right answer.)

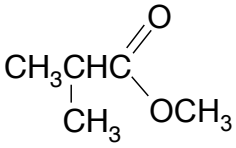
(iv) sodium methanoate (If it has only got one carbon, the name is based on "meth".)

2. a) (i) 

(Remember that the first part of the name defines the right-hand side of the structure, and vice versa.)

(ii) 

(iii) 

(iv) 

b) (i) ethyl ethanoate

(ii) methyl methanoate

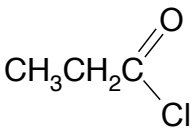
(iii) propyl ethanoate

(iv) ethyl butanoate

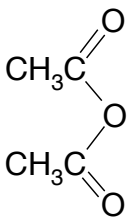
If you got all these ester questions right, well done! A lot of people get confused when working out names or structures for esters. If you didn't get them right, and can't understand why not, re-read the Chemguide page that these questions refer to, and also have a look at the top of the page introducing esters - http://www.chemguide.co.uk/organicprops/esters/background.html

If you got them wrong by making silly mistakes, and think you could now do better, don't try them again until tomorrow so that you have time to forget the right answers. You aren't trying to *learn* what the answer is, but how to work it out.

Don't leave this until you are sure you can do it. You need to be able to do this anyway, but sorting it out will give you a major confidence boost.

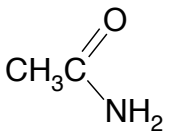
3. a) 

b) ethanoyl chloride

4. a) 

b) butanoic anhydride

5. a)



b) butanamide

6. a) $CH_3CH_2C{\equiv}N$

(Don't forget that the -CN carbon counts as part of the chain. You might well get away with just drawing the nitrile group as -CN, but if in doubt show all the important bonding.)

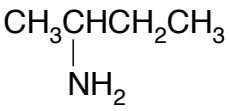
b) 2-hydroxybutanenitrile

7. a) (i) $CH_3CH_2NH_2$

(ii) $CH_3CH_2NH_2$

(Ethylamine and aminoethane are alternative names for the same compound.)

(iii)

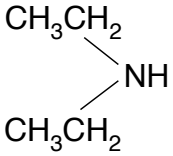


(You might equally well have numbered this from the other end, drawing the NH_2 group on the other middle carbon atom.)

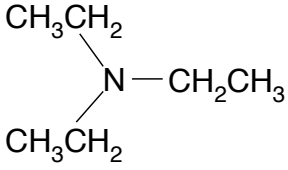
(iv) $H_2NCH_2CH_2CH_2CH_2CH_2CH_2NH_2$

(The 1,6-diamino bit means that there are two amino groups (one on the number 1 and one on the number 6 carbons) in a 6 carbon chain (hex). You could draw the chain with the NH_2 groups hanging off it, but if you draw it as above, be very careful on the left-hand end. You should show that it is the nitrogen which is attached to the carbon by reversing the group to H_2N-. You might argue that we don't seem to bother with this when writing CH_2 groups one after the other, but that's life!)

(v)



(vi)



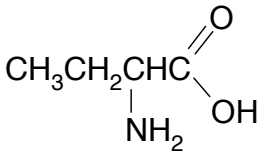
b) (i) 1-aminopropane

(ii) 2-aminopropane

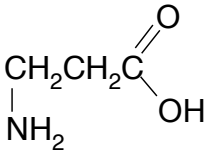
(iii) dimethylamine

(iv) trimethylamine

8. a) (i)



(ii)



(If you have drawn the NH_2 group in line with the chain, make sure that you have reversed it as H_2N so that the nitrogen is clearly joined to the carbon.)

b) (i) 2-aminopropanoic acid

(ii) 2-aminoethanoic acid