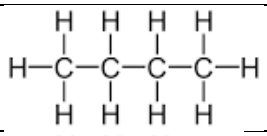
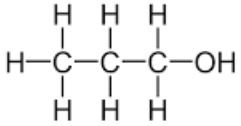
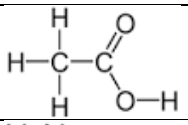
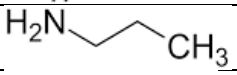
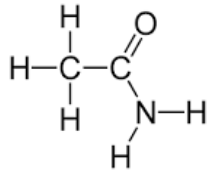
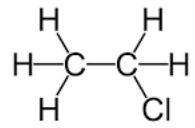
Revision 4 Trends and electrolysis

1)

Compound	Structural formula	Molar mass	Boiling temp ^{o}C	Intermolecular bonding
Butane		58	-1	
Propanol		60	97	
Ethanoic acid		60	118	
Propanamine		59	49	
Ethanamide		59	210	
Chloroethane		64	12	

a) Describe the intermolecular bonding of each molecule.

b) Name the functional group in each molecule.

c) Consider the two molecules, ethanamide and propanamine.

i. Both exhibit H-bonding and yet ethanamide has a higher boiling temperature. Explain why. Draw a diagram.

Ethanamide	Propanamine

ii. Which one would be least soluble in water? Explain

d) Consider the molecules pentanamide and propyl ethanoate.

i. Draw the structural formula of each molecule

pentanamide

propyl ethanoate
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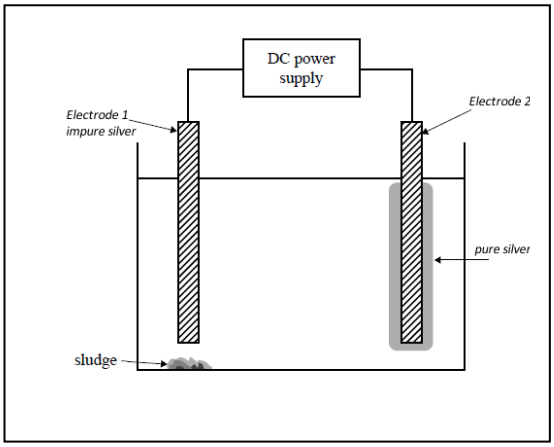
ii. Which molecule will have the highest boiling temperature? Explain

iii. Draw a diagram to show how pentanamide and propyl ethanoate interact with water and discuss which one is most soluble in water? Indicate on your diagram charge and type of intermolecular bonding.

2) An electrolytic cell is set up to obtain pure silver from an impure piece of silver. The electrolyte solution contains silver nitrate. The impure silver, Electrode I, contains impurities such as zinc, cobalt, copper, gold, nickel and iron. The cell voltage is adjusted so that only silver is deposited on Electrode II. Sludge, which contains solid metal impurities present in the impure silver, forms beneath Electrode I. The other impurities remain in solution as ions.
The diagram on the right represents the cell.



a) What are the metals in the sludge?

b) What metal ions from the impure silver remain in the electrolyte?

c) What is the polarity of each electrode?

d) The cell runs for 2.40 hours at a current of 1.89 A. What mass, in kg, of silver is deposited during this time. Answer is must be to the right number of significant figures.