

Orgo Assignment ✓

[58 marks]

44.5
58

Communication [15 marks] 12

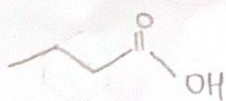
1. The following compounds have comparable molar masses. Arrange the compounds in order of increasing boiling points and give reasons for your answer. Also, draw each compound below its name. [6 marks]

butanoic acid

pentylamine

dipropyl ether

benzene



- polar
- hydrogen bonding

how
different?

- polar
- HB

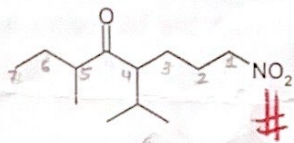
- polar
- NO HB

- Non polar
- NO HB

in order: Benzene, dipropyl ether, pentylamine, benzoic acid

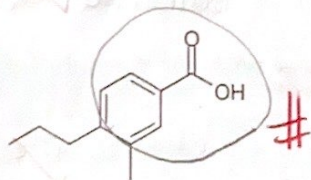
2. Write the IUPAC name for each of the following compounds. [5 + 4 = 9 marks]

(a)



5-methylethyl-3-methyl-8-nitrooctan-4-one

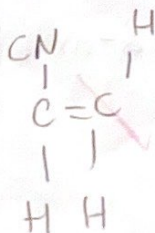
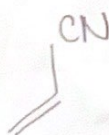
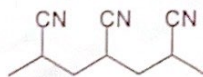
(b)



2-methyl-1-propylbenzoic acid

Making Connections [6 marks]

3. Orlon is the name of a synthetic material used to make fabric and clothing. It is an addition polymer. A portion of its structure is shown below. Draw a structural diagram of its monomer. [3 marks]



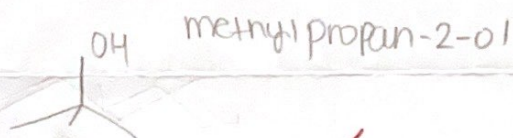
4. Lactic acid (2-hydroxypropanoic acid), produced by bacterial culture in yogurt, contains a hydroxyl group and a carboxyl group in each molecule. Draw a structure of two repeating units of a condensation polymer of lactic acid molecules. [3 marks]



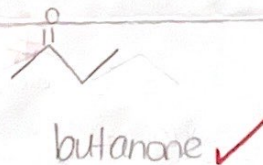
Knowledge & Understanding [10 marks]

5. Draw the structure and provide a name for each of the following. [10 marks]

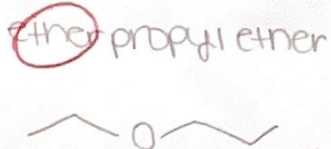
(a) A tertiary alcohol with the formula $C_4H_{10}O$.



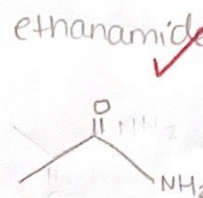
(d) A ketone with the formula C_4H_8O .



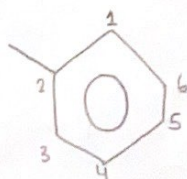
(b) An ether with the formula $C_5H_{12}O$.



(e) An ester with the formula C_2H_5ON .



9 (c) An aromatic compound with the formula C_7H_8 .

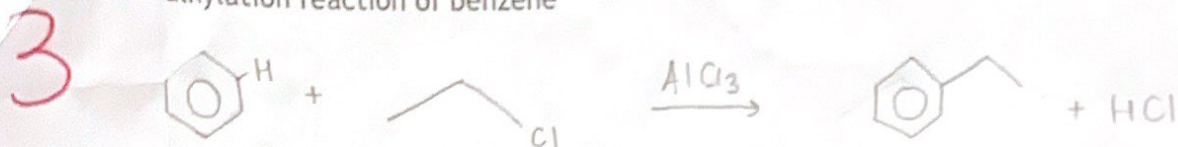


2-methylbenzene

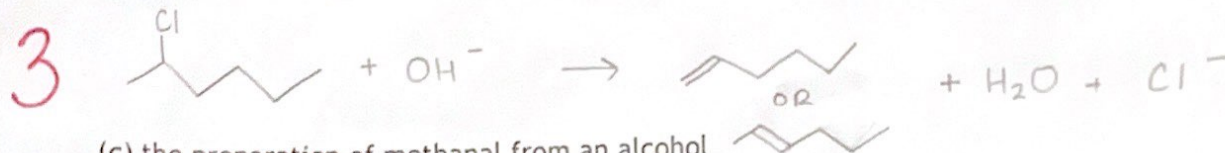
Inquiry [27 marks]

6. Write the chemical equations to illustrate the following reactions. [15 marks]

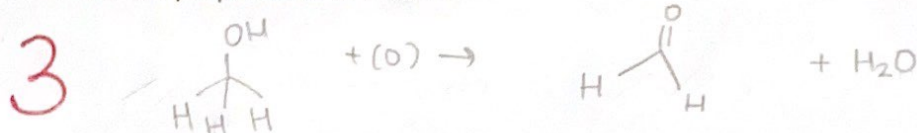
(a) an alkylation reaction of benzene



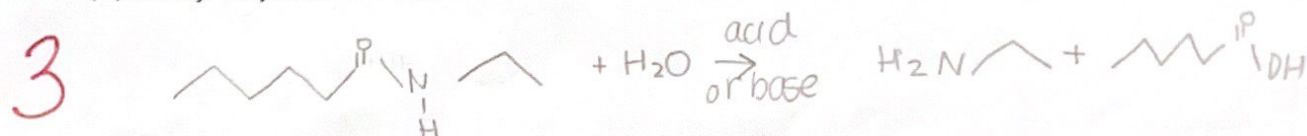
(b) an elimination reaction of 2-chlorohexane



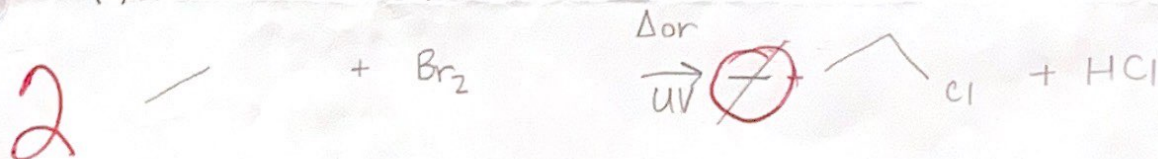
(c) the preparation of methanal from an alcohol



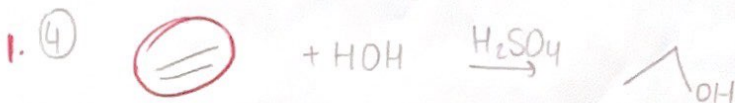
(d) the hydrolysis of N-ethyl hexanamide



(e) the formation of an alkyl halide from ethane



7. Describe a reaction pathway to synthesize 2-methylbutyl ethanoate, starting from ethane. Include all pertinent conditions. Show all reactants and products using structural diagrams. [12 marks]



5

