Introduction Of Presentation From Organic Chemistry Assignment

The chemical reaction between different organic functional groups

Results will be observed and explained

Different cycling groups will be used

This study will present the chemical reactions formed between different organic groups. Chemical tests of these groups were performed and the results were compared with standard results for the positive test.

1. Contents

Functional groups react to give different precipitates and reactions (Xie et al. 2020)

A test for alcohol and ketones has been performed

The functional groups were treated with different reagents and the results were observed. Different reagents were used such as bromine water, Fehling's reagent, Tollen's reagent. The changes in reaction helped in explaining the chemical properties of different organic compounds.

2. Hexane + Bromine water reaction

Hexane reacts with bromine water and forms **"bromhexane and hydrogen bromide"** (Kim et al. 2020)

$C6H14+Br2 \rightarrow C6H13Br+HBr$

As per the reaction, it can be said that the alkane reacts with halogen for producing haloalkane. It turns the colour of bromine water from orange to colorless

3. The reaction of ethanoic acid + calcium carbonate

Ethanoic acid belongs to the carboxylic acid group (Vidra and Németh, 2018)

It reacted with CaCo3 and developed calcium salt, and carbon dioxide

The statements explained the reaction in detail. It can be added that Effervescence was observed that formed a white precipitate while passing through lime water

4. Halogenoalkane + NaOH -> Product + nitric acid + silver nitrate

Halogenoalkane reacts with NaOH to form halide (Tang et al. 2020)

A **"white, cream or yellow"** precipitate of halide will be noticed

The reaction was tested by testing **chloromethane** with an **"aqueous solution of sodium hydroxide".** White precipitate of chloride was noticed using AgNO3. This test is known as the **"neurophilic substitution reaction"**

5. Aldehyde + Fehling's, Aldehyde + Tollens's, Aldehyde + Potassium dichromate

Aldehyde is treated with Fehling's reagent and gives a **"red precipitate"** (Ramya et al. 2022)

Reaction with Tollen's reagent produces a **"silver mirror"**

Aldehyde turns the orange solution of **"Potassium dichromate"** green

The red colored precipitate is formed because of **"Copper (I) oxide"** and the mirror is formed because the silver gets deposited. A **"silver mirror"** can be produced during the reaction with Tollen's reagent

6. Explanation of structures used

Cyclic structures of the **functional groups** were used

The hydrogen ions replaced the halogen

Carbonate ion replaced the acid structure

The above statements have explained the structures of functional groups in detail. In addition, the hydrogen ions replaced the halogen and Carbonate ion replaced the acid structure.

7. Compare and contrast reactions from alcohols + ketones

Alcohol turns the orange **"potassium dichromate"** solution green

The solution remained orange when treated with Ketone (Zhang et al. 2018)

The statements have compared the reaction of alcohol and ketones in detail. It can be stated that that no change was noticed while Ketone was introduced with Fehlings and Tollen's reagent

8. Results table from the experiment

Functional Group	Balanced Reaction
Alkane (Hexane)	$C_6H_{14}+Br_2 \rightarrow C_6H_{13}Br+HBr$
Carboxylic Group (Ethanoic Acid)	$CaCo_3+2CH_3COOH \rightarrow Ca(CH_3COO)_2+CO_2+H_20$
Halogenoalkane (Chloromethane)	$CH_3Cl+NaOH \rightarrow CH_3OH+NaCl$
Aldehyde	? $CH_3CHO+2Cu^{2+}+5OH \rightarrow CH_3COO^-+Cu_2O+3H_2O$? $CH_3CHO+2Ag(NH_3)_2^-+3OH \rightarrow 2Ag+CH_3COO^-+4NH_3+2H_2O$

The above table has explained the experiment. It has been observed that Orange bromine water turns colorless in case of Alkane group. In effervescence formed that develops white precipitate while passed through limewater. White precipitate of Chloride was observed in Halogenoalkane. In addition, Red precipitate was observed for Fehling's reagent and Silver mirror was observed for Tollen's reagent during aldehyde reaction.

Reference

Kim, H., Kim, H.T., Lee, J.H., Hwang, H. and An, D.K., 2020. Lithium bromide: An inexpensive and efficient catalyst for imine hydroboration with pinacolborane at room temperature. RSC Advances, 10(57), pp.34421-34427.

Ramya, S., Loganathan, T., Chandran, M., Priyanka, R., Kavipriya, K., Pushpalatha, G.G.L., Aruna, D., Ramanathan, L., Jayakumararaj, R. and Saluja, V., 2022. Phytochemical Screening, GCMS, FTIR profile of Bioactive Natural Products in the methanolic extracts of Cuminum cyminum seeds and oil. Journal of Drug Delivery and Therapeutics, 12(2-S), pp.110-118.

Tang, Y.L., Zheng, X., Qi, Y., Pu, X.J., Liu, B., Zhang, X., Li, X.S., Xiao, W.L., Wan, C.P. and Mao, Z.W., 2020. Synthesis and anti-inflammatory evaluation of new chalcone derivatives bearing bispiperazine linker as IL-1β inhibitors. Bioorganic chemistry, 98, p.103748.

Vidra, A. and Németh, Á., 2018. Bio-produced acetic acid: a review. Periodica Polytechnica Chemical Engineering, 62(3), pp.245-256.

Xie, P., Wang, J., Liu, Y., Fan, J., Wo, X., Fu, W., Sun, Z. and Loh, T.P., 2018. Water-promoted CS bond formation reactions. Nature communications, 9(1), pp.1-8.

Zhang, R.R., Yin, Q., Liang, H.P., Chen, Q., Luo, W.H. and Han, B.H., 2018. Hypercrosslinked porous polycarbazoles from carbazolyl-bearing aldehydes or ketones. Polymer, 143, pp.87-95.