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CLASSIFICATION, STRUCTURE, PREPARATION, COMPLEX PROPERTIES AND AREAS OF APPLICATION OF CARBOXYLIC ACIDS

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Abstract. We all know that carboxylic acids are found in many compounds and in the free state. They are produced in industry in many ways and are used in many fields. The most common types of them are essential oils and fats.

Key words. Aromatic dicarboxylic acids, correction, phthalic acid, electrophilic, substitution, isophthalic acid.

INTRODUCTION

Carboxylic acids are organic acids that contain one or more carboxyl groups (□COOH) in their molecules. The carboxyl group contains the groups □OH, where one oxygen atom is attached to a carbon atom, and =O, where one oxygen atom is attached to a carbon atom. There are many types of carboxylic acids, and they are used in many chemical reactions and in various fields. The general structure of carboxylic acids: R-COOH: Where R can be a carbon chain or an aryl group.

There are several types of carboxylic acids, for example:

- monocarboxylic acids
- dicarboxylic acids
- aromatic carboxylic acids

The properties of carboxylic acids are based on their chemical structure and molecular structure, and they have different physicochemical properties. The main properties of carboxylic acids are:

- Acidic properties: these, in turn, are divided into 2 types: Proton (H^+) separation and acidity level.

$$R{-}COOH \rightleftharpoons R{-}COO^- + H^+$$

- Solubility; good solubility: Carboxylic acids, especially simple aliphatic carboxylic acids (e.g., methanoic acid, ethanoic acid), are highly soluble in water. This is because the

hydroxyl (-OH) and carbonyl (=O) groups in their carboxyl group readily bind to water, making the molecule water-soluble.

Many polycarboxylic acids: Some carboxylic acids with many carboxyl groups, such as succinic acid, malonic acid, may be highly soluble, but their solubility differs from that of aliphatic acids.

- The carboxyl group is highly reactive, and they can undergo many chemical reactions

Heat resistance. Carboxylic acids vary in their heat resistance. Simple carboxylic acids often have low melting points and evaporate easily. For example, ethanoic acid (acetic acid) boils at 118°C. However, some polycarboxylic acids may have higher melting points.

As for their areas of use, they are mainly used as disinfectants and preservatives, in the food industry, and in a number of other areas due to their corrosive properties. Carboxylic acids are widely distributed in nature, both free and in combination. They are part of oils, essential oils, and fresh fruits. Carboxylic acids are obtained from natural compounds (higher fatty acids, citric acid, etc.) or synthetically, for example, by oxidizing alcohols and aldehydes. Carboxylic acids are also widely obtained by fermentation (butyric acid, lactic acid, acetic acid fermentation). Carboxylic acids and their derivatives are widely used in the national economy. For example, various soaps are made based on distilled fatty acids obtained from cottonseed oil. The production of varnishes and enamels has been established based on highly branched fatty acids (HFA) obtained by telomerization.

CONCLUSION

Carboxylic acids have a variety of physical and chemical properties, and their acidic nature, solubility, reactivity, role in biochemical processes, and industrial applications make them of widespread practical importance. Their properties ensure their use in chemistry, biochemistry, pharmaceuticals, the food industry, and other fields.

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