European Scholar Journal (ESJ)
Available Online at: https://www.scholarzest.com
Vol. 3 No.9, September 2022
ISSN: 2660-5562

MODERN METHODS OF STUDYING CHEMISTRY AND POLYMER CHEMISTRY IN TECHNICAL UNIVERSITIES

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Article history:

Received: 30th June 2022
Accepted: 28th July 2022
Published: 4th September 2022

Abstract:

The protection of plants and agricultural products from various diseases and pests with the help of chemicals is devoted in this article. To date, it is necessary to create new drugs that meet modern requirements both in terms of efficiency and safety for humans and the environment. About the need for chemical compounds of fungicide, herbicides, defoliants, insecticides and acaricides that protect crops and products from pests, diseases caused by fungi, bacteria and viruses, and also play an important role in plant growth and increasing yields. And in this, chemists will have to strengthen the teaching of the subject of chemistry in an agricultural university.

Keywords: plant protection, agricultural products, pests, chemicals, efficiency, safety, environment, fungicide chemical compounds, yield increase.

Reforms to improve the quality of the education system in our country, equipping educational institutions with modern educational laboratories, expanding the level of cooperation between higher educational institutions and the world's leading scientific and educational institutions create opportunities to improve the effectiveness of teaching natural and chemical sciences. At the same time, there is a need to strengthen the methodological system in practice in teaching chemistry. In particular, the article focuses the attention of students of agricultural universities, mainly in the process of listening to a lecture, the purpose of the lecture should be to increase the productivity of agricultural products and make it environmentally friendly.

At the present stage of the integrated development of agricultural production, the role of a complex of methods such as agrotechnical, organizational and economic, preventive, chemical, biological, etc. drugs. The range of chemical plant protection products is not rich, and the problem of creating new drugs that meet modern requirements in terms of both efficiency and safety for humans and the environment (ecology) is extremely important.

Today, the protection of plants and agricultural products from various diseases and pests with the help of chemicals is an urgent issue.

The development of plants is negatively affected by pathogens, various bacteria, fungi and viruses. If crops and grown products are not regularly protected with a chemical composition, 30-40% of them will not reach the consumer.

In addition to protecting plants and crops from various diseases, pests, and weeds, pesticides are chemicals used in the removal of cotton leaves.

It is a fungicide chemical compound that protects crops and products from diseases caused by fungi, bacteria and viruses, and plays an important role in plant growth and crop yields.

When protecting crops from weeds with herbicides, they are mainly treated by spraying with chemical compounds in solution, and in some cases chemical compounds are used by spraying without granules and powder. Herbicides are used during the sowing period before the emergence of seedlings of crops and during the growing season of crops.

Insecticides and acaricides are synthesized from chemicals that protect agricultural crops from pests, mainly from compounds belonging to various classes of organic substances (compounds of phosphorus and organochlorine compounds, carbon dioxide and phenols, compounds of pertroids and other chemical classes). Of the inorganic substances, sulfur-based compounds and mineral oils are mainly used.

Classification of insecticides and acaricides

Chemical compound class	Effects on contact and gastrointestinal tract	Fumigants
1. Inorganic compounds 2. Organic compounds		Sulfur and its chemical compounds
a)organophosphorus compounds	fazalon, talstar, trebon, aktelik, bazudin, dureban, metaphos,	Fostok

	fostovan, cyanok, metation, hostavik, nexion, karbofos, etafos	
b)obrganic compounds of chlorine and bromine	Heptachlor, Dilor, Keltan, Tiadon, Omite, HCH, Neoron, Chlorpyrifos	bromine, methyl, methyl chloride, hexachlorobutadione, dichloroethane
c) compounds based on carbamic acid	sevin, ivin, pyrimor, achitratz, mitak, sami-alpha, talstar, trebon	
d)synthetic perethroids	decis, danitol, karate, mitak, nurel, tsimbush, ambush, corsair, rinkord	
e)compounds of various hydrocarbons	Preparation 30, mineral oils, decoction of sulfuric lime	Sulfur, colloidal sulfur

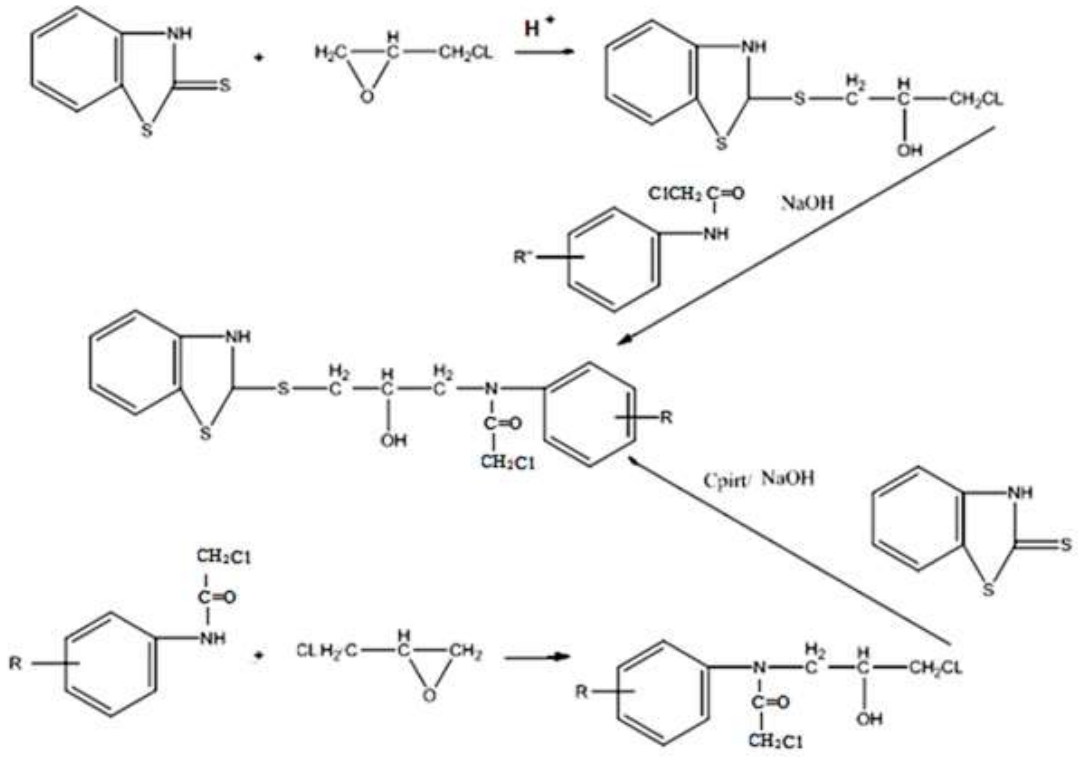
Defoliants are mainly used in cotton growing, they are treated with a solution of chemical compounds before picking cotton, to drop cotton leaves. 10–12 days after processing cotton with deformations, the cotton sheet should crumble as much as possible. As a result of shedding of cotton leaves under the influence of deformation, cotton buds develop and open better due to faster maturation.

We managed to study the synthesis of the reaction of epichlorohydrin with arylamines and benzothiazole and obtain the expected result.

We can also observe specific reactions of changing the epoxy group as a result of their interaction with the following substances. Only here a phase transfer catalyst must be present, since the alkylation reaction of aromatic anides is more complex than the alkylation reaction of amines.

When the condensed heterocyclic thione-benzothiazoline-2-thione reacts with epichlorohydrin under mild conditions without the presence of a catalyst, the benzazole propyl derivative 2-(2-hydroxy-3-chloro) is obtained: high temperature and participation of the catalyst 3 - (2,3-epithiopropyl) benzene- thio or 1,3-bisbenzthiazolyl-2-thio(propan-2-ol).

2-(2-Hydroxy-3-arylaminopropylthio) benzothiazole was synthesized from 2-(2-hydroxy-3-chloropropylthiol) benzothiazole in the presence of an alkaline solution with aromatic amines. This substance is also obtained by the action of benzothiazolin-2-thione in the presence of hydrogen chloride acceptors on a compound formed by the interaction of amines of another route with epichlorohydrin in equal molecular ratios:



Ar=C_6H_5-, R=o,м,п-CH_3

The amount of free substance obtained by both methods is almost the same.

Using the example of benzimidazole-2-thione, the free substance -2-(2-hydroxy-3-arylamidopropylthio) benzimidazole is obtained only by the second method. The first route results in a two- or three-ring combination of benzimidazole with epichlorohydrin.

The structure of the obtained substance 1-benzotizolin-2-hydroxy-3-chloroacetropropane was proved by the physicochemical method.

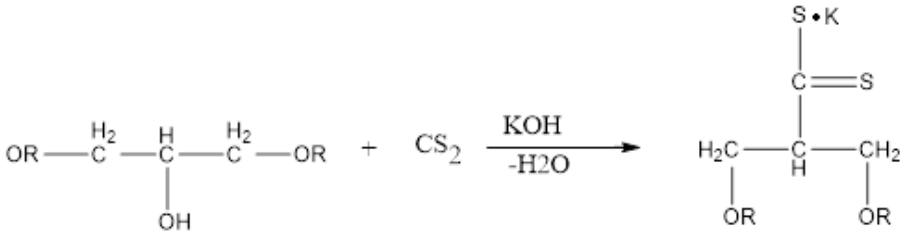
In the PMR spectrum of the above compound, the C-CH3 proton corresponds to a signal in the form of a triplet in the region at 1.51 ppm. (multiplet). The IR spectra of N-chloroacetanilide contain absorption bands of one carbonyl

$(-N-\underset{|}{C}=O)$ 1665-1670 cm^{-1}; (C=C) benzene rings at 1490-1500 cm^{-1}; 740 cm -1 (-CH2Cl), has a wide band at 3400-3500 cm^{-1} (-OH).

Acylation reactions were also carried out on the OH and N- group.

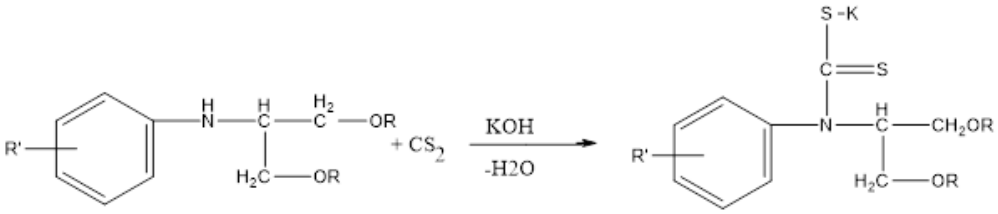
The interaction of 1,3-(dialkoxy)-2-hydroxypropane with carbon disulfide was carried out in the presence of KOH, and the following xenthates were obtained with a yield of 55–60%:

1) 1,3-(dipentoxy)-2-potassium dithiocorbamate;
2) 1,3-(dihexoxy)-2-potassium dithiocorbamate;



R= C_5H_{11}—; C_6H_{11}—;
R'=CH_3-;

The reaction of 1,3-(dialkoxy)-2-arylaminopropane with carbon disulfide in the presence of KOH proceeds rapidly. The interaction was first carried out with cooling, then slightly heated for 1 hour (90^{0}-100^{0}, in a water bath). Potassium salt 1,3-(dialkoxy)-2-arylamidodithiocorbamatepropane was isolated in crystalline form (up to 80%).



R= C_5H_{11}—; C_6H_{13}—;
R'= H_3C—;

We have obtained a physiologically active water-soluble substance:

1) 1,3-(dipentoxy)-2-arylamidodithiocorbamate propane potassium salt;
2) 1,3-(dihexoxy)-2-arylamidodithiocorbamatepropane potassium salt;

All of the above end products exhibit the herbicidal effects on annual weeds.

Physicochemical properties of the obtained compounds

№	Name	Exit %	T_{melt} ^0C	T_{boil} ^0C	Gross formula
1	1-benzochange-2-hydoxy-3-chloroacetpropane	56	-	178-180/3мм	$C_{18}H_{20}N_2O_2S_2K$
2	1,3-(dipentoxy)-2-potassium dithiocorbamate	62	126-128	-	$C_{14}H_{27}O_3S_2K$
3	1,3- (dihexoxy) -2-potassium dithiocorbamate	60	130-132	-	$C_{16}H_{31}O_3S_2K$
4	1,3-(dipentoxy) -2-aryldithiocorbamate potassium propane	80	152-155	-	$C_{21}H_{35}NO_2S_2K$
5	1,3-(dihexoxy)-2-aryldithiocorbamate potassium propane	82	160-162	-	$C_{23}H_{39}NO_2S_2K$

In the above scientific article, students of the Agrarian University study the types of pesticide preparations and the physiological activity of pesticides, their low environmental impact when studying chemistry. They get an idea about the synthesis of certain organic compounds that retain sulfur.

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