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Forewords

Praise and gratitude to Allah SWT, because of Allah's love for us so that we are still given a long life and can carry out our various daily activities. May all our activities become our acts of worship, Aamiinnn

in accordance with the commitment of the Jurnal Serambi Ilmu Journal to continue to improve the quality of its manuscripts since the volume 22 number 1 has been published full in English.

We are also be proud that the number of submitted manuscripts is quite large, but only a few are acceptable and worthy of publication. This means that Jurnal Serambi Ilmu has become one of the scientific publications that are considered by experts and education enthusiasts.

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Determination of Preservative Levels of Sodium Benzoate in Packaged Mayonnaise UV-Vis Spectrophotometry as an Effort to Improve Practice Experience Basic Chemistry Course Students

Lidyawati[1*], Muhammad Nazar[2], Fadli Syahputra[3]

[1*]Lidyawati is the Lecturer of Akademi Farmasi YPPM Mandiri, Banda Aceh, Indonesia
Email: lidyawati.mpipa@gmail.com
[2]Muhammad Nazar is the Lecturer of Universitas Syiah Kuala, Banda Aceh, Indonesia
Email : mnazar.unsyiah@gmail.com
[3]Fadli Syahputra is the Lecturer of Akademi Farmasi YPPM Mandiri, Banda Aceh, Indonesia
Email: lidyawati.mpipa@gmail.com

Abstract
Sodium benzoate is the sodium salt of benzoic acid which is often used in processed foods and beverages, According to the regulation of the Head of BPOM RI No. 36 of 2013, this preservative is permitted in its use but has a limit on the use of mayonnaise, which is 1000 mg/kg body weight. The purpose of this study was to determine the content of sodium benzoate and the levels in packaged mayonnaise. This research was conducted at the Chemistry Laboratory of the Faculty of Teacher Training and Education, Syiah Kuala University, Banda Aceh to improve the student learning experience in basic chemistry courses, using five samples of packaged mayonnaise. The results showed that the five samples of packaged mayonnaise were positive for the preservative sodium benzoate. Determination of the preservative content of Sodium benzoate was determined using UV-Vis spectrophotometry method at max 280 nm. From the measurement results, the sodium benzoate content of sample M1 = 68 mg/kg, sample M2 = 35.5 mg/kg, sample M3 = 85.5 mg/kg, sample M4 = 95.5 mg/kg and M5 mg/kg = 30.5 and the use of preservative sodium benzoate in the packaged mayonnaise does not exceed the maximum limit that has been set.

Keywords: Sodium Benzoate, Mayonnaise, chemistry learning

ITRODUCTION

Food producers in Indonesia are currently experiencing very rapid development and also fierce competition to get quality products. Processing, packaging and storage are the determining factors whether or not the food and beverages can be consumed. Various stages of food and beverage processing starting from preparation to packaging can occur contamination of food or beverage ingredients, to prevent microbes in food ingredients from developing, it is necessary to add certain other ingredients as

preservatives into the food ingredients, then the use of materials food additives in food, especially processed foods, are unavoidable.Food producers in Indonesia are currently experiencing very rapid development and also fierce competition to get quality products. Processing, packaging and storage are the determining factors whether or not the food and beverages can be consumed. Various stages of food and beverage processing starting from preparation to packaging can occur contamination of food or beverage ingredients, to prevent microbes in food ingredients from developing, it is necessary to add certain other ingredients as preservatives into the food ingredients, then the use of materials ood additives in food, especially processed foods, are unavoidable.

One of the factors that can make a food product last longer is by adding food preservatives such as sodium benzoate. These preservatives are used to prevent the growth and kill various microorganisms such as molds, yeasts, and bacteria. The food additives used aim to increase the organoleptic value, inhibit microbial growth and extend the shelf life of the product (Bassett and Mendham, 2009).

Likewise, the opinion expressed by Adriani and Zarwinda (2019), which states that food is a basic need in human life, where food usually contains additional ingredients that are added intentionally to food and beverages in the packaging, processing, to increase or maintain nutritional value. , improve quality, reduce waste and improve storage in order to improve character and improve food quality, such as preservatives, dyes, sweeteners, bleaches, flavorings, anti-caking agents, antioxidants, emulsifiers, stabilizers, acidity regulators, and hardeners, such as in sauces added with dyes. and preservative.

A preservative that is often used in the food and beverage industry in a certain amount is sodium benzoate. Sodium benzoate is often used to preserve various foods and beverages, such as fruit juices, soft drinks, tomato sauce, chili sauce, jams, jellies, sweets, soy sauce and others (Cahyadi, 2009). Benzoate which is commonly used is benzoate in the form of its salt because it is more soluble than the acid, in foodstuffs, the benzoate salt decomposes into an effective form, namely the undissociated form of benzoic acid. This form has a toxic effect on excessive consumption of consumers, so that the provision of this preservative does not exceed 0.1% in foodstuffs. Consumption of sodium benzoate preservative that is too frequent should be avoided because it will cause a buildup of preservatives in the body (Herliani, 2010).

Sodium benzoate is a chemical that is often used as a preservative in processed foods and beverages. This tasteless substance consists of the combination of benzoic acid with sodium hydroxide. Sodium benzoate (C6H5COONa) has the characteristics of being stable, odorless, in the form of white crystals, stable in air, easily soluble in water, slightly soluble in ethanol and more soluble in 90% ethanol (Depkes RI, 1995).

Processed foods and drinks contain preservatives that sometimes make us anxious. One of the food preservatives that is often mixed is sodium benzoate or sodium benzoate. Some parties claim this material is safe for consumption. However, there are other groups who also doubt its safety. Preservatives are not foreign to be found in everyday life, because almost all types of food and beverages use preservatives. For example, bread jam, so that bread jam lasts for a very long time,

manufacturers add preservatives, a preservative that is often used in bread jams is sodium benzoate. The desired storage time in a certain period is able to increase economic efficiency. (Rahmi, 2018).

According to Permenkes of Health Minister (Number 033 of 2012) permitted food additives in food include the following:

1. Food Additives consisting of the following groups::
   a. Antioxidants are food additives that can prevent or inhibit oxidation.
   b. Anticaking agent is a food additive that can prevent clumping of food in the form of powder.
   c. Acidity Regulator (Acidity Regulator) is a food additive that can produce, neutralize and maintain the acidity of food.
   d. Artificial sweeteners are food additives that can cause a sweet taste in food, which has almost no nutritional value.
   e. Bleach and flour treatment agents are food additives that can accelerate the process of whitening and ripening flour so as to improve quality.
   f. Emulsifiers, stabilizers, thickeners (Emulsifier, Stabilizer, Thickener) are food additives that can provide the formation or stabilization of a homogeneous dispersion system in food.
   g. Preservatives are food additives that prevent or inhibit fermentation, acidification or other decomposition of food caused by microorganisms.
   h. Firming agent is a food additive that can harden or prevent or soften food.
   i. Color is a food additive that can improve or give food color.
   j. Causes of Taste and Aroma, Flavor enhancers (Flavor, Flavor, Enhancer) are food additives that can provide or emphasize taste and aroma.
2. For foods that are permitted to contain more than one antioxidant, the quotient of each ingredient and the maximum limit for its use if the sum is not more than one.
3. For foods that are permitted to contain more than one preservative, the quotient of each ingredient with the maximum limit for its use if the sum is not more than one.
4. For foods that are permitted to contain more than one preservative, the quotient of each ingredient with the maximum limit for its use if the sum is not more than one.
5. The limit of "adequate" use is the use in accordance with good production methods, which means the amount added to the food does not exceed the reasonable amount required in accordance with the intended use of the food additive.
6. In food additives of the preservative group, the maximum limit for the use of benzoate salt is calculated as bezoic acid, sorbet salt as sorbet acid and sulfite compounds as SO2.

Many local processed food products are produced and traded in Indonesia, including chili sauce and packaged mayonnaise. Sambal and mayonnaise are complementary foods that must be present in every Indonesian dish, both home-cooked and in restaurants, so many producers make ready-to-eat chili sauce and

mayonnaise that are packaged in such a way. Not many packaged foods do not have preservatives as additives in packaged foods. According to research conducted by Siaka (2009), the use of benzoate preservatives in chili sauce still exceeds the threshold determined by the Minister of Health of the Republic of Indonesia, so this research needs to be carried out to identify and determine the level of use of sodium benzoate preservatives in circulating local production. .

Research on the determination of sodium benzoate preservative levels in food samples has been carried out including research on soy sauce using spectrophotometry, the content of benzoic acid in soy sauce product samples A, B, C, D which were analyzed quantitatively as follows: 269.9 mg/kg, 278.3 mg /kg, 270.8 mg/kg, 268.3 mg/kg, the product is declared not to exceed the threshold for the use of benzoic acid that has been determined (Sumarauw, et al., 2013).

The results of the two studies showed that the samples of soy sauce and sweet soy sauce were positive for using benzoic acid as preservatives, and the levels of these preservatives in the samples did not exceed the threshold stipulated in BPOM RI Regulation No. 36 of 2013, the maximum limit for benzoate preservatives is not more than 1000 mg/kg of ingredients. Subsequent research regarding the determination of preservative levels in packaged chili, of the 6 samples tested by UV-Vis spectrophotometry two of them were positive for containing sodium benzoate preservative and sodium benzoate content obtained in sample A 157.767 mg/kg and sample B 182.8 mg/kg is still safe from the limit on the use of sodium benzoate preservatives in the Regulation of the Minister of Health No.722/Menkes/PER/IX/88, which is 1000 mg/kg (Dewi, et al., 2019).

Likewise, research on the analysis of benzoic compounds in chili sauce at a fast food fried chicken restaurant in Manado conducted by (Purwaningsih, 2016), a solution of chloroform extract added with 5% FeCl3 reagent produces salmon deposits or a brownish red ring, this can occurs because of the bonding reaction between 3 benzoate ions from benzoic acid with ferric ions (Fe3+) from ferrichloride which forms a ferribenzoic chelate compound with a hydrochloric acid molecule, according to the reaction:

$$C_6H_5COOH + FeCl_3 \longrightarrow Fe(C_6H_5COO)_3 + 3HCl$$

(Red precipitate)

The test of the four chili sauce samples which was carried out by qualitative analysis turned out to be positive for the four samples containing benzoate compounds because there was a brownish red precipitate with the benzoate content in the chili sauce being A: 0.411 g/kg; B : 0.454 g/kg ; C: 0.336 g/kg; D : 0.344 g/kg. the preservative content does not exceed the threshold for the use of benzoate compounds that have been determined in the Regulation of the Head of the Food and Drug Supervisory Agency of the Republic of Indonesia Number 36 of 2013.

Analysis of the preservative sodium benzoate has also been tested on bulk strawberry jam in traditional markets, Luwitono and Darmawan (2019) stated that samples of bulk strawberry jam traded in several traditional markets in Jebres District, Surakarta were not all positive for sodium benzoate, where out of 10 samples obtained

there were 8 samples were positive for sodium benzoate. The bulk strawberry jam sold in several traditional markets in Jebres District, Surakarta which is positive for sodium benzoate does not meet the requirements of SNI 01-0222-1995 by looking at the sodium benzoate content.

Mayonnaise is a type of sauce made from the main ingredients of vegetable oil, chicken eggs and vinegar. Mayonnaise is generally used as a flavoring in foods such as sauces in fast food, including pizza, kebabs, burgers, okonomiyaki, and takoyaki. Manufacturers usually use preservatives to extend the shelf life of packaged mayonnaise, preservatives such as sodium benzoate are used. Sodium benzoate is more widely used in food and beverage products because of its stability and good solubility in water (Ren, et al., 2014). Benzoic acid and its salts are the most widely used preservatives in food and beverages because they are cheap and easy to find. According to the Regulation of the Head of BPOM RI No. 36 of 2013 this preservative is permitted in its use but has a limit for its use, namely 1000 mg/kg body weight (BPOMRI, 2013).

In this modern era, we find many people who suffer from diseases caused by harmful additives in food such as food preservatives, especially nowadays many people consume fast food. Dangers of benzoic acid and its salts if excessive in use can cause metabolic acidosis, seizures and hyperpnoea (Lau and Wong, 2018). It can also cause stomach cramps, numbness in the mouth. These preservatives can worsen the situation and are accumulative which can cause cancer in the long term (Hesti, et al., 2016). Consumption of sodium benzoate can affect body functions and metabolic processes involving glycine.

On exposure to sodium benzoate by mouth, skin, or inhalation, there have been reports of urticaria, asthma, rhinitis, or anaphylactic shock, which are common in people with a history of atopic disease (Wibbertmann et al 2005). Research on the effect of benzoate preservatives on kidney damage has been carried out by Hilda (2015), that the use of benzoate must be in accordance with the maximum limit that has been determined, namely 0-5 mg/kg body weight of the consumer, if in excess it will cause negative effects for the body's organs, one of which is kidney.

Many things can be done to keep the kidneys functioning well, namely avoiding junk food because these foods use a lot of benzoate preservatives and high salt and if consumed in the long term will cause a decrease in blood pressure and will trigger kidney stone disease. The majority of those affected by kidney disease are men, but not only men, women can also experience kidney disease due to an unhealthy lifestyle. As you age, your kidney function decreases, making you more susceptible to kidney disease.

Currently, there has been no real effort from the relevant government officials in overcoming the problem of violations of labeling products containing sodium benzoate and potassium sorbate, such as the discovery of the basic ingredients for making fruit jam using a mixture of several rotten fruits, the addition of artificial

sweeteners and preservatives in the form of excess sodium benzoate. , as well as the use of textile dyes to get food products with a more attractive color appearance (Setiawati, et al., 2013).

Research on UV-Vis spectrophotometry analysis can be used to measure the concentration of sodium benzoate, because sodium benzoate has a chromophore (the part of the pigment that is most sensitive to light stimulation / the group that causes the molecule to become colored in the UV-Vis region) in the form of an aromatic benzene group which is an absorbent. strong UV rays, so that it can increase the fluorescence / emission of light by a substance (Gandjar and Rohman, 2017).

Based on the above, given the lack of public awareness of health, the public needs to be given knowledge about the dangers posed by the use of sodium benzoate as a preservative in food. Therefore, in this study, a test was carried out regarding the determination of the content of sodium benzoate in mayonnaise. In this study, the main method of UV-Vis spectrophotometry was used to determine the sodium benzoate content in packaged mayonnaise, also useful as learning material for basic chemistry courses.

RESEARCH METHODS

This research method is descriptive analytic to see the color reaction of benzoic acid and quantitative analysis by UV-Vis spectrophotometry, which involves students in the pharmacy study program, YPPM Mandiri Pharmacy Academy Banda Aceh which aims to give students the opportunity to test and apply theory using laboratory facilities. , as an effort to improve students' practical experience in basic chemistry courses, according to the opinion expressed by (Chebii, et al., 2012), which states that students can learn science well when teaching methods allow them to be actively involved in learning science. class activities.

They should actively participate in conducting experiments, conducting demonstrations, class discussions and other relevant learning experiences. Likewise, the opinion expressed by Mehram (2017), that laboratory activities which in this case are better known as experiments are very important learning activities and cannot be separated from teaching Chemistry in totality. Experimental activities through laboratories are the application of scientific work in teaching, the results of experimental activities will be able to grow students' scientific attitudes.

Research Time and Place

This research was carried out in June-August 2021, at the Chemistry Laboratory, Faculty of Teacher Training and Education, Syiah Kuala University, Banda Aceh.

Tools and materials

The tools used in this research are glassware commonly used in chemical research, analytical balance, spatula, stative, clamps, hot plate, and UV-Vis Spectrophotometer. The materials used in this study were diethyl ether (Merck),

distilled water, benzoic acid (Merck), filter paper, HCl (Merck), NH3 (Merck), FeCl3 (Merck), NaCl (Merck) and blue litmus paper.

Sampling

Samples in the form of packaged mayonnaise were obtained in Banda Aceh City by collecting 5 samples of mayonnaise sold in supermarkets. Then the mayonnaise samples were coded M1, M2, M3, M4 and M5.

Sample Setup

A total of 5 grams of the sample was put into a 100 mL volumetric flask. Add 100 mL of saturated sodium chloride, shaken homogeneously and filtered, then put into a separating funnel with 0.1% hydrochloric acid added. After homogeneously the sample was extracted with 20 mL, 15 mL, 10 mL and 5 mL parts of ether, shake and separate the ether parts, combine the extracted ether and then wash with 15 mL, 10 mL and 5 mL of 0.1% hydrochloric acid and take the ether extract. . Then the ether portion was extracted with 15 mL, 10 mL and 5 mL 0.1% NH4OH and the ether portion was discarded. Ammonium extract was added 0.1% hydrochloric acid to acid. Then extracted with 20, 15, 10 and 5 mL ether. Take the ether parts and merge (Herlich, 1990).

Qualitative Analysis

Color reaction of benzoic acid

Samples that have been extracted with ether pipette as much as 0.5 ml, add 2 ml of distilled water, shaken, centrifuge for 10 minutes. Take the top of the centrifuge sample and put it in a drip test tube with 3% FeCl3. The sample is positive if it forms a yellowish-orange color precipitate (Asra, et al., 2019).

Quantitative Analysis

Preparation of 120 ppm Benzoic Acid Motherboard in Ether 3 mg of benzoic acid was dissolved in 25 mL of ether and homogenized. Making a Calibration Curve from a Benzoic Acid Solution, Series solutions were made with concentrations of 20 ppm, 40 ppm, 60 ppm, 80 ppm, 100 ppm at the maximum wavelength.

Determination of Sample Rate

According to Herlich (1990), the absorbance of the obtained ether extract was measured using a UV-Vis spectrophotometer. The level of benzoic acid in the sample is determined based on the linear regression equation: y = a + bx Description: y = Absorbance (independent variable), b = slope (regression coefficient), a = Intercept, and x = Concentration (dependent variable)

RESULTS AND DISCUSSION

In this study, an analysis of the sodium benzoate preservative contained in packaged mayonnaise sold in supermarkets was carried out, involving students from the Pharmacy Program, of YPPM Mandiri Pharmacy Academy Banda Aceh. The mayonnaise used is sample M1, sample M2, sample M3, sample M4 and sample M5. Sampling was done by collecting packaged mayonnaise sold in supermarkets, then coded on the sample.

The purpose of involving students in this research is so that students can see directly / prove what they have learned in learning theory in class. Practicum is a learning activity that aims to give students the opportunity to test and apply theory by using laboratory facilities, according to the opinion expressed by Fakhrrazie and Fathony (2016) through practicum, students can gain direct experience to observe physical phenomena that occur, so that better understand the concepts being taught.

.Lecturers must be able to read interests and recognize each student's character, because then learning materials can be absorbed properly so that success in learning can be achieved. Sumar and Razak (2016) suggest that active learning is learning that involves students actively and becomes the center of learning. Educators must try to determine the right approach, model and method so that the material presented can be understood and understood, and students know the use of the material in everyday life. Whether or not a learning process is effective depends on the learning design prepared by the educator. A good learning design is a learning design that contains strategies that can enable students to play an active role in learning activities through various learning experiences, both physically and mentally. From this learning experience, it encourages changes in students both from the cognitive, affective and psychomotor aspects (Imadiah, 2019).

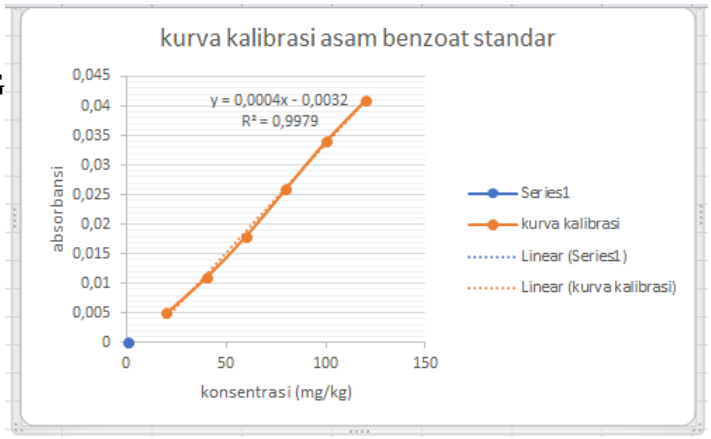
Materials regarding qualitative and quantitative analysis in basic chemistry courses in the pharmacy study program are difficult for students to understand if they are only studied in theory, because students try to understand the material by imagining, therefore, researchers try to provide a learning experience process through practical methods so that Students are faster in remembering, understanding and understanding the material presented. Learning is very easy to understand when it is associated with everyday life, so that when students solve / find answers to a problem it becomes easier.

Practicum is one of the activities that aims to provide students with provisions to better understand theory and practice. According to Zainuddin (1996) (in Susanti, 2013), through practicum activities, many things can be obtained by students including 1). Practical activities can train skills, 2). Provide opportunities for students to apply and integrate their knowledge and skills in practice, 3). Proving something scientifically/conducting scientific inquiry, and 4). Appreciate the knowledge and skills of inquiry. Therefore, the researcher is interested in inviting students to increase their practical experience regarding identification or qualitative and quantitative analysis on samples that are commonly used in the wider community, thereby helping students to better understand and understand more about qualitative and quantitative analysis materials.

This research was started by making standard 120 ppm benzoic acid mother liquor with diethyl ether solvent, then measured the wavelength in the range of 200 nm - 400 nm, obtained a wavelength of 280 nm, according to the wavelength range of benzoic acid which is between 265 nm - 280 nm . After determining the maximum wavelength, then a calibration curve is made by measuring the absorbance of pure benzoic acid with various concentration levels, namely 20 ppm, 40 ppm, 60 ppm, 80 ppm, 100 ppm, from the results of the calibration curve the regression equation y = 0.0004x - 0.0032 with a correlation coefficient (r) of 0.9979. The standard benzoic acid calibration curve can be seen in Figure 1.

Image 1
Acid Calibration Curve

G



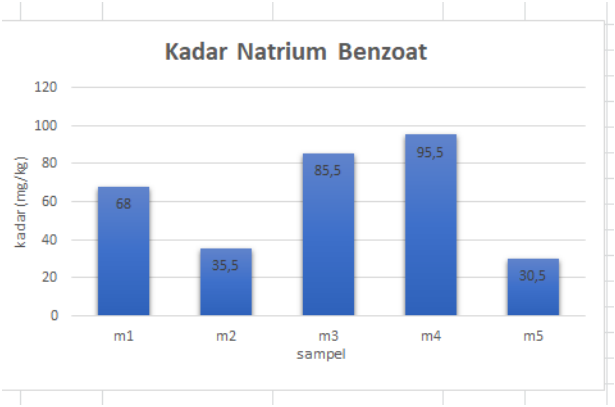
Source: Research Results 2021

Qualitative and quantitative analysis was carried out in this study, the five selected samples were first extracted by weighing 5 grams of the sample then dissolved in saturated sodium chloride solution to increase the specific gravity of water so that the water and ether separating power was large and the emulsion did not occur during the extraction process. Furthermore, the sample solution is filtered with filter paper, this filtering aims to remove impurity particles such as dust.

The filtered solution was added with 0.1% HCl until the acidic pH measured with blue litmus paper was dipped in the solution until it turned red. The acidic solution is put into a separating funnel, then extracted using ether as a solvent because benzoic acid is semi-polar and can dissolve in ether, which is semi-polar as well. Extraction is done repeatedly so that the benzoic acid in the mayonnaise can be filtered perfectly. The ether extract obtained was washed with 0.1% hydrochloric acid to remove basic impurities, then 0.1% ammonium hydroxide was added to obtain an ammoniac extract. The ammoniac extract was extracted again with ether in an acidic environment with the addition of 0.1% hydrochloric acid to prevent the dissociation of benzoic acid in order to obtain an ether extract (Asra, et al., 2019).

Qualitative analysis was carried out on five samples of mayonnaise that had been extracted with ether and added with distilled water, then centrifuged for 10 minutes and the top of the centrifugal sample was put into a test tube, then dripped with 3% FeCl3 to produce a yellowish orange solution which indicates that The five samples were positive for benzoic acid, but the levels were small so that when FeCl3 was added there was no precipitate due to the small amount of precipitation which caused no precipitate to form. benzoate, it turned out that after analysis the five samples were positive for the preservative sodium benzoate.

Figure 2
Bar Diagram of Sodium Benzoate Levels in Mayonnaise Samples



Source: Research Results 2021

Quantitative analysis or assay was carried out on samples that were positive for sodium benzoate, namely sample M1, sample M2, sample M3, sample M4 and sample M5. The ether extract obtained was about 50 mL, then the absorbance was measured using a UV-Vis Spectrophotometer. After obtaining absorbance (y) then substituted in the equation y = 0.0004x - 0.0032 so that the benzoic acid content in sample M1 = 68 mg/kg, sample M2 = 35.5 mg/kg, sample M3 = 85.5 mg /kg, M4 = 95.5 mg/kg, M5 = 30.5 mg/kg. The preservative content of sodium benzoate contained in five samples of mayonnaise was categorized as safe for consumption because it was still below the threshold level of preservative sodium benzoate allowed by BPOM RI No. 36 of 2013. The bar chart of sodium benzoate content in the Mayonnaise sample can be seen in Figure 2.

CONCLUSION

Based on the results of the research and data processing, it can be concluded as follows:

1. Qualitative analysis of mayonnaise samples M1, M2, M3, M4 and M5 tested positive for the preservative sodium benzoate. From the quantitative analysis, it was found that the preservative content of sodium benzoate in mayonnaise, sample M1 = 68 mg/kg, sample M2 = 35.5 mg/kg, sample M3 = 85.5 mg/kg, M4 = 95.5 mg/kg, M5 = 30 ,5 mg/kg.

2. From this study, the concentration of sodium benzoate preservative obtained did not exceed the limit stipulated in the regulation of the Head of the Food and Drug Supervisory Agency of the Republic of Indonesia No. 36 of 2013, which states that the use of sodium benzoate as a preservative that is allowed in mayonnaise is 1000 mg/kg BW.

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REFERENCES

- Bassett dan Mendham. (2009). *Buku Ajar Vogel Kmia Analisa Kuantitatif Anorganik*, Jakarta: Buku Kedokteran EGC.
- Adriani, A., dan Zarwinda, I. (2019). Pendidikan Untuk Masyarakat Tentang Bahaya Pewarna Melalui Publikasi Hasil Analisis Kualitatif Pewarna Sintetis Dalam Saus. *Jurnal Serambi Ilmu*, 20(2), 217-237.
- Cahyadi, W. (2009), *Analisis dan Aspek Kesehatan Bahan Tambahan Pangan*. Edisi Kedua. Jakarta: Bumi Aksara.
- Herliani, (2010). *Pengawet Makanan Alami dan Sintetis*. Bandung : Alfabeta.
- Depkes RI, (1995), *Farmakope Indonesia IV*, Departemen Kesehatan Republik Indonesia, Jakarta.
- Rahmi, S. (2018). Analisis Pengawet Dan Pemanis Buatan Pada Selai Roti Yang Beredar di Pasar Sekitar Kota Medan. *Jurnal Penelitian Pendidikan MIPA*, 3(1), 217-225.
- Permenkes RI. (2012). *Permenkes Tentang Bahan Tambahan Pangan*. Jakarta: Pemerintah Republik Indonesia.
- Siaka. (2009). Analisis Bahan Pengawet Benzoat Pada Saos Tomat yang Beredar di Wilayah Kota Denpasar. *Jurnal Kimia*, 3(2): 87-92.
- Sumarauw, W., Fatimawali, F., dan Yudistira, A. (2013). Identifikasi dan Penetapan Kadar Asam Benzoat pada Kecap Asin yang Beredar di Kota Manado. *PHARMACON*, *2*(1).
- Taib, M.Z., Wehatouw, F., dan Fatimawali. (2014). Analisis Senyawa Benzoat pada Kecap Manis Poduksi Lokal Kota Manado. *Jurnal Ilmiah Farmasi-UNSRAT*. 3(1), 2302-2493.

- Dewi,K.A.Y., Pramitha, D.A.I dan Juliadi, D. (2019). Penetapan Kadar Pengawet Natrium Benzoat Pada Sambal Kemasan Secara Spektrofotometri UV-Vis. *Jurnal Ilmiah Medicament.* 5(1): 39-44.
- Purwaningsih, I. (2016). Analisis Senyawa Benzoat pada Saus Sambal di Rumah Makan Ayam Goreng Cepat Saji di Manado. *PHARMACON*, 5(3).
- Luwitono, C. P. W. D., dan Darmawan, P. (2019). Analisis Pengawet Natrium Benzoat pada Selai Stroberi Curah di Pasar Tradisional. *Biomedika*, 12(2), 244-250.
- Ren L, Meng M, Wang P, Xu Z, Eemin SA, Zhao J. (2014). "Determination of Sodium Benzoate in Food Products by Fluorescence Polarization Immunoassay". *Talanta.* 121:136-43.
- Badan Pengawas Obat dan Makanan RI. (2013), *Peraturan Kepala Badan Pengawas Obat dan makanan Nomor. 36 Tentang Batas Maksimum Penggunaan Bahan Tambahan Pngan Pengawet.* Jakarta: Badan POM RI.
- Lau, J. T. F., dan Wong, Y. (2018). *Antioxidants and Preservatives*. *Reference Module in Chemistry, Molecular Sciences and Chemical Engineering* (3rd ed.). Elsevier Inc. http://doi.org/10.1016/b978-0-12-409547-2.14471-3.
- Hesti, Muzakkar, M. Z., dan Hermanto. (2016). Analisis Kandungan Zat Pengawet Natrium Benzoat pada Sirup Kemasan Botol yang Diperdagangkan di Mall Mandonga dan Hypermart Lippo Plaza Kota Kendari. *Jurnal Sains Dan Teknologi Pangan*, 1(1), 51–57.
- Wibbertmann, A., Kielhorn, J., Koennecker, G., Magelsdrof, I., dan Melber. (2005). *International Programme on Chemical Safety's Concise International Chemical Assessment Documents Number 26: Benzoic acid and sodium benzoate*. Geneva : World Health Organization.
- Hilda, N. (2015). Pengaruh Pengawet Benzoat Terhadap Kerusakan Ginjal. *Jurnal Keluarga Sehat Sejahtera*, 13(26), 14–21.
- Setiawati, D.A., Nurmaini., dan Chahaya, I. (2013). "Analisa Kandungan Natrium Benzoat, Siklamat pada Selai Roti yang Bermerek dan Tidak Bermerek Serta Tingkat Pengetahuan Penjual di Pasar Petisah Kota Medan Tahun 2013". *Jurnal Kesehatan Lingkungan*, 2(1): 1-8.
- Gandjar, I. G., dan Rohman, A. (2017). *Kimia Farmasi Analisis*. Yogyakarta: Pustaka Pelajar.
- Chebii, R., Wachanga, S., dan Kiboss, J. (2012). Effects of science process skills mastery learning approach on students' acquisition of selected chemistry practical skills in school. *Creative Education*, 3(1), 1291- 1296.
- Mehram, M. (2017). Upaya Meningkatkan Kemampuan Guru dalam Merancang Eksperimen Virtual Kimia Sederhana dengan Microsoft Power Point Melalui Workshop MGMP Kimia SMA Binaan. *Jurnal Serambi Ilmu*, 18(1), 1-10.
- Herlich, K.(1990). Official *Methods of Analisis* (15th ed). Virginia: Association of Official Analyticcal Chemical press.
- Asra, R., Zulharmita, Z., dan Rondasi, I. (2019). Analisis Kuantitatif Natrium Benzoat pada Kecap Kedelai Manis Produksi Lokal di Kota Padang dengan Metode Spektrofotometri Ultraviolet-Visible. *Borneo Journal of Pharmascientech*, 3 (1).

- Fakhrrazie dan Fathony. (2016). Pengaruh Pembelajaran Metode Praktikum pada Materi Laju Reaksi Terhadap Hasil Belajar Siswa MAN. *Jurnal Pendidikan dan Pembelajaran Khatulistiwa*, 5 (3).
- Sumar, W.T, dan Razak, I, A. (2016). *Strategi Pembelajaran dalam Implementasi Kurikulum Berbasis Soft Skill.*Yogyakarta: Deepublish.
- Imadiah, (2019) Peningkatan Prestasi Belajar Siswa pada Materi Aplikasi Fungsi Melalui Metode Penemuan Terbimbing. *Jurnal Serambi Ilmu,* 20 (1), pp. 79-96.
- Susanti, Rahmi. (2013). Pengaruh Penerapan Pembelajaran Berbasis Masalah pada Praktikum Fotosintesis dan Respirasi untuk Meningkatkan Kemampuan Generik Sains Mahasiswa Biologi FKIP Universitas Riau. *Jurnal Nasional*. *Palembang*: Unpublished.