

Making Solid Soap From Local Coconut Oil With Addition to Temulawak Powder (*Curcuma zanthorrhiza*)

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Abstract

This study aims to determine the effect of variations in the concentration of NaOH solution on the physical and chemical quality of solid soap made from local coconut oil added with ginger powder. The method in this study was an experimental method carried out at the Laboratory of Natural Sciences, Faculty of Science, CokroaminotoPalopo University. There are three variations in the concentration of NaOH solution, namely 20%, 30% and 40%. The results showed that the degree of acidity (pH) of soap with a concentration of 20% NaOH solution and 30% NaOH was 11. While the pH of soap with a concentration of NaOH solution was 40% by 12. Thus, the pH of the soap with a concentration of 20% NaOH solution and NaOH solution 30 % meets the standard quality of solid bath soap. While soap with a concentration of 40% NaOH solution does not meet the quality standard. The organoleptic test results showed that soap with a concentration of NaOH solution of 20% for testing criteria for texture, aroma and moisture was not good, the color was in a good category and the foam was not foaming. Soap with a concentration of NaOH solution of 30% for testing criteria for texture, color, aroma and moisture with good categories and foam with very much foam category. Soap with a concentration of NaOH solution of 40% for testing criteria for texture, color, aroma and moisture with very good categories and foam with very much foam category.

Keywords: *Coconut Oil, Solid Soap, Ginger*

1. Background

Soap is a cleaning agent that is commonly used because of its ability to lift fat or other impurities. Soap is made through the process of saponification of fatty oils with alkaline solutions to liberate glycerol (Fessenden, 1986). Soap is sodium or potassium salt from long-fatty fatty acids. Fatty acids usually consist of 12 to 18 carbon atoms (Riyadhi, *et al.*, 2010). Fatty acids with a carbon chain of less than 12 will cause irritation to the skin, while more than 18 carbon chains will make the soap hard and difficult to dissolve in water (Anwar, 1966). The oil fat used can be animal fat, vegetable oil, wax, or sea fish oil. The content of substances found in soap also varies according to the nature and type of soap. The alkali solution used in making soap depends on the type of soap. The usual alkaline solution used in hard soap is sodium hydroxide (NaOH) and alkali which is commonly used in soft soap is Potassium Hydroxide (KOH) (Toha *et al.*, 2013).

This research utilizes local coconut oil in the Luwu Raya area to maximize the use of local coconut oil. Coconut oil has generally been used by people in Luwu land for decades. The production process of local coconut oil is still using the manual method, which is through the fermentation process for approximately 2 days followed by the heating process.

Coconut oil produced will be used as cooking oil or can also be used as balur oil for skin and hair. Soap has the ability as a cleanser that is quite widely used by humans. Lately, solid bath soap has also been used as a beauty soap. Therefore, additional soap is needed which functions as an antioxidant and anti-inflammatory to prevent infection from bacteria or microbes (Aryadi, 2014). One ingredient that has antibacterial and antioxidant properties, namely ginger. Ginger is one of the spice plants that has long been used in Indonesia. Aside from being a flavoring for food, ginger powder is also used as a traditional scrub material because it is so popular that it can remove scars on the skin or can also cure inflammation on the skin. The results of phytochemical analysis showed that the content of phenols, flavonoids, triterpenoids and glycosides was more dominant than tannins, saponins, and steroids. The average levels of essential oils and starch were 3.81% and 41.45%, respectively (Eni, 2006). From the results of the analysis, it can be seen that in ginger powder there are secondary metabolites which can function as anti-propulsion and antioxidants.

Based on this background, the researchers were interested in making soap made from local coconut oil with ginger powder. This study aims to determine how the effect of the concentration of NaOH solution on the quality of oil-based soaps and powdered ginger. The quality of the soap tested is pH, texture, color, foam, aroma and moisture.

2. Methods

This research is an experimental research which aims to see the effect of the concentration of NaOH base solution on the quality of coconut oil based soap with the addition of ginger powder.

Tools and materials

The tools used in this study are volume pipettes, measuring cups, beaker glass, drop pipettes, analytic balance, magnetic stirrers, plastic spray bottles, thermometers, hot plate stirrers, mixers, plastics, and soap molds. The ingredients used are local coconut oil, 0.1 N NaOH, glycerine, olive oil, ginger powder and pH paper (universal indicators).

Soap Making (Soaping)

Make a NaOH solution with a concentration of 20, 30 and 40%. Furthermore, mixing oil and NaOH with a ratio of 50 mL of coconut oil into a 25 mL NaOH solution then heated by using a hot plate at 55 oC and stirring using a magnetic stirrer at a speed of 500 rpm. After 25 minutes stir, add 2 mL olive oil, 3 grams of ginger powder and 3 grams of glycerine. Stirring is continued until the 45th minute. The solution of soap that has thickened is put into the soap mold and covered with plastic, and left for 2 days to become solid (Al-Idrus *et al.*, 2016).

pH testing

A total of 5 mL soap solution (sap) was put into a 250 mL measuring cup and then tested the acidity in a solution. The acidity level in question is the concentration of hydrogen ions in water solvents, the pH of the soap ranges from 9.0-10.8. Compare this with the pH value with pure oil in the packaging and the pH of the soap purified by used cooking oil (Pratiwi, 2017).

Orgnoleptic Test

Organoleptic tests were carried out to determine panelists' preference for soap made based on texture, appearance (color and shape of soap), foaming, fragrance, soft impression and stiff impression of soap, then processed using the Likert method to determine the preference index for the parameters of soap tested (Ahmadi *et al.*, 2015).

3. Results and Discussion

Based on Table 1, soap made with the addition of 20% NaOH solution and 30% NaOH solution has the same pH of 11. Whereas soap made with 40% NaOH solution has a pH of 12.

According to SNI (1994) the pH of solid soap is between 9–11. Thus, the pH of soap with a concentration of 20% NaOH solution and 30% NaOH solution meets the standard quality of solid bath soap. While soap with a concentration of 40% NaOH solution does not meet the quality standard.

Table 1. Results of pH testing of soap

Sample	pH
20% NaOH solution	11
30% NaOH solution	12
40% NaOH solution	12

Table 2. Test results for solid soap organoleptics

Sample	Testing Criteria				
	Texture	Color	Foam	Aroma	Moisture
20% NaOH Concentration	VG = 0	VG = 0	VMF = 0	VG = 0	VG = 0
	G = 0	G = 16	F = 0	G = 0	G = 0
	NG = 18	NG = 2	NF = 18	NG = 18	NG = 18
30% NaOH Concentration	VG = 0	VG = 0	VMF = 17	VG = 0	VG = 0
	G = 18	G = 16	F = 0	G = 18	G = 17
	NG = 0	NG = 2	NF = 1	NG = 0	NG = 1
40% NaOH Concentration	VG = 18	VG = 17	VMF = 17	VG = 16	VG = 17
	G = 0	G = 1	F = 1	G = 2	G = 1
	NG = 0	NG = 0	NF = 0	NG = 0	NG = 0

Information:

- VG = Very good
- G = Good
- NG = Not Good
- VMF = Very Much Foam
- F = Foaming
- NF = Not Foaming

Based on Table 2, soap quality testing based on organoleptic tests using respondents as many as 18 people. Soap testing includes five criteria, namely texture, color, foam, aroma and moisture. In more detail can be seen in each of the following graphs.

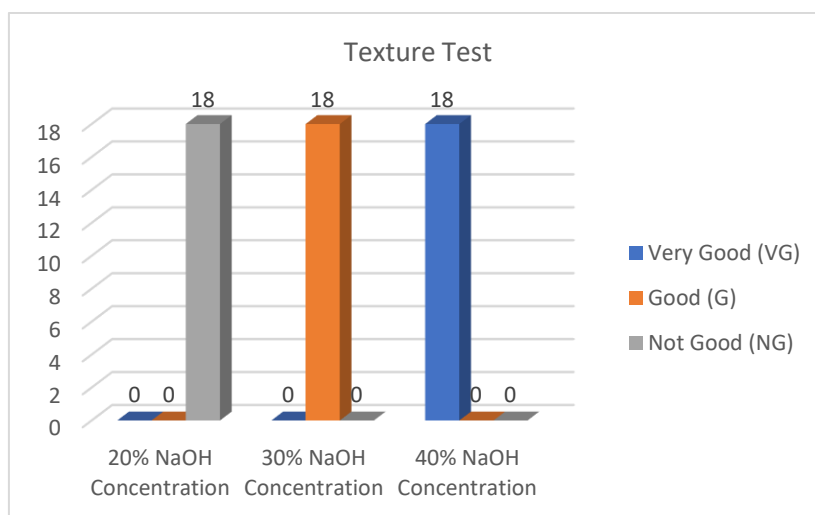


Figure 1. Graph of solid soap texture test criteria

Based on the graph in Figure 1, the results of testing the soap texture criteria showed that soap with a concentration of 20% NaOH solution was in the bad category with 18 respondents. Soap with a concentration of 30% NaOH solution is in the good category with the number of respondents 18 people. Soap with a concentration of 40% NaOH solution is in a very good category with 18 respondents.

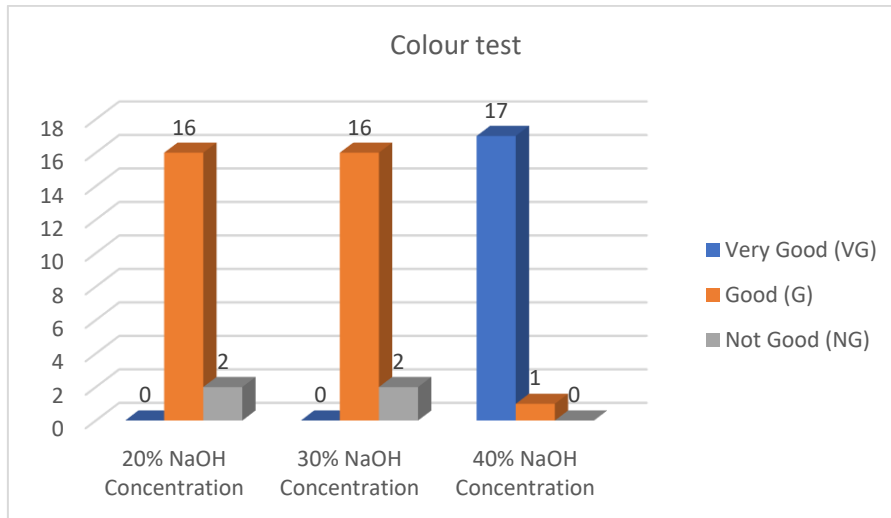


Figure 2. Graph of solid soap color test criteria

Based on the graph in Figure 2, the results of testing the color criteria for soap showed that soap with a concentration of 20% NaOH solution was in the good category with the number of respondents 16 people. Soap with a concentration of 30% NaOH solution is in the good category with the number of respondents 16 people. Soap with a concentration of 40% NaOH solution is in a very good category with the number of respondents 17 people.

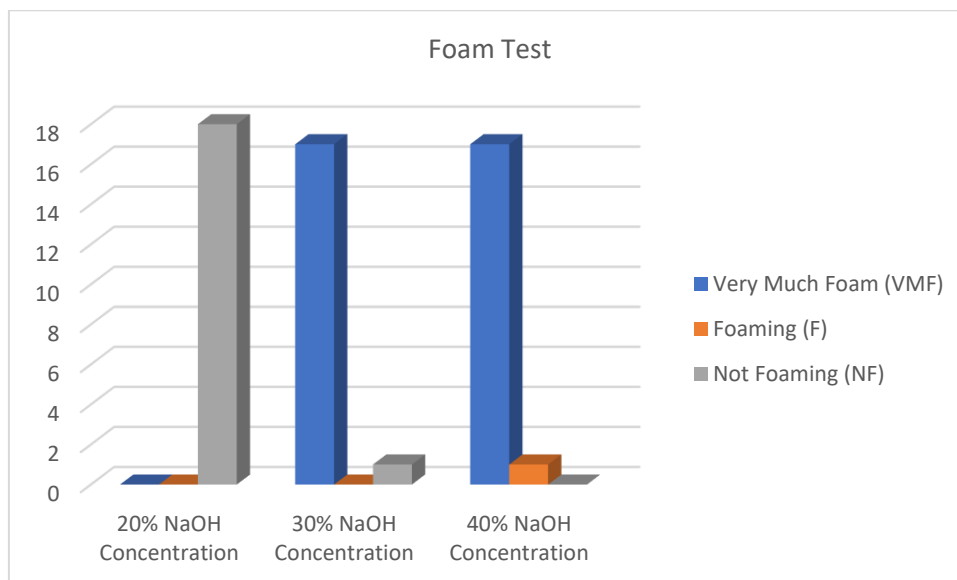


Figure 3. Graph of solid soap foam test criteria

Based on the graph in Figure 3, the results of testing the foam soap test criteria showed that soap with a concentration of 20% NaOH solution was in the non-foaming category with the number of respondents 18 people. Soap with a concentration of 30% NaOH solution is in the very foam category with 17 respondents. Soap with a concentration of 40% NaOH solution is in the very foam category with 17 respondents.

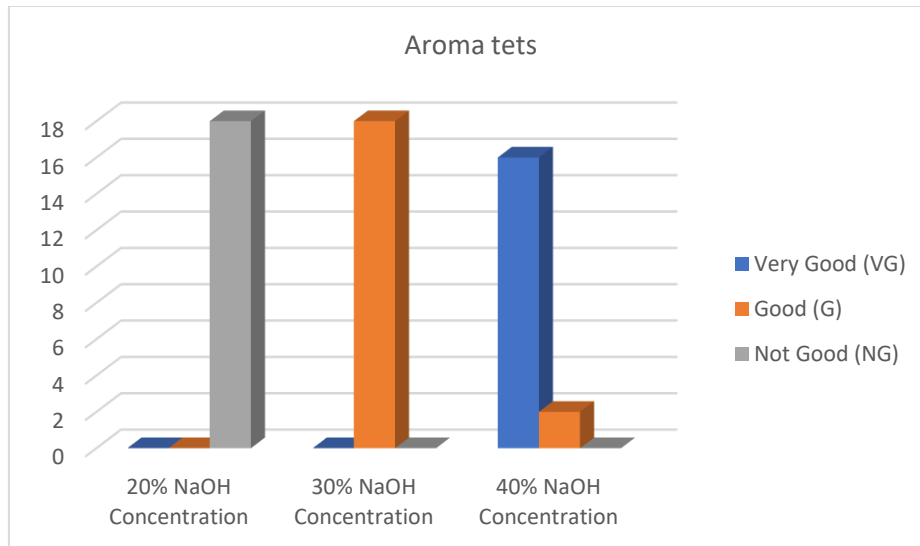


Figure 4. Graph of solid soap aroma test criteria

Based on the graph in Figure 4, the results of testing the aroma soap criteria showed that soap with a concentration of 20% NaOH solution was in the bad category with 18 respondents. Soap with a concentration of 30% NaOH solution is in the good category with the number of respondents 18 people. Soap with a concentration of 40% NaOH solution is in a very good category with the number of respondents 16 people.

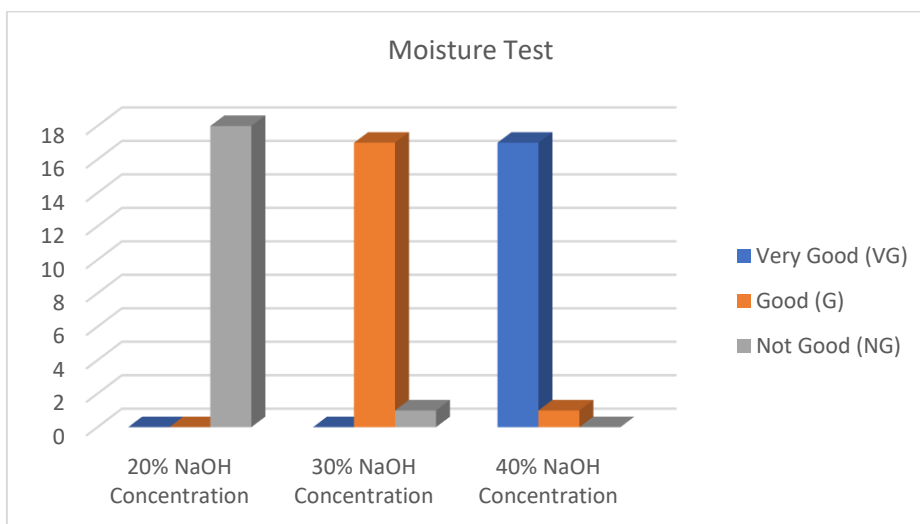


Figure 5. Graph of solid soap moisture test criteria

Based on the graph in Figure 5, the results of testing the soap moisture criteria indicate that soap with a concentration of 20% NaOH solution is in the bad category with 18 respondents. Soap with a concentration of 30% NaOH solution is in the good category with the number of respondents 17 people. Soap with a concentration of 40% NaOH solution is in a very good category with the number of respondents 17 people.

From the results of organoleptic tests on the three solid soaps namely solid soap with a concentration of 20%, 30% and 40% NaOH, it can be concluded that soap with a concentration of 40% NaOH solution is in the very good category of criteria for texture, color, aroma and moisture and has a lot of foam.

4. Conclusion

The results showed that the acidity (pH) of soap with a concentration of 20% NaOH solution and 30% NaOH amounted to 11, had met the pH standard based on SNI. While the pH of soap with a concentration of 40% NaOH solution is 12, passing the quality standard. The organoleptic test results showed that soap with a concentration of NaOH solution of 20% for testing criteria for texture, aroma and moisture was not good, the color was in a good category and the foam was not foaming. Soap with a concentration of NaOH solution of 30% for testing criteria for texture, color, aroma and moisture with good categories and foam with very much foam category. Soap with a concentration of NaOH solution of 40% for testing criteria for texture, color, aroma and moisture with very good categories and foam with very much foam category.

5. Citation and References

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