Adsorption processes based activated carbon from waste biomass and its application as a raw material ceramic membrane wastewater in processing kain songket

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Abstract. The main environmental problem in the textile industry is the waste from the dyeing process. Heavy dye and heavy metals are water pollutants. The most widely used method in water treatment is filtration using membrane technology. Membrane technology has several advantages, such as separation process that can occur at room temperature and its use is not destructive. In this research will be made membrane with basic forming material such as bentonite, clay (clay), activated carbon as additive in filtration process. The activated carbon used is made from avocado seed which is carbonized with a temperature of 500°C for 1 hour.

This research is used to know the influence of flow rate and the best time of contact with ceramic membrane during the treatment of songket wastewater and to know the result of ceramic membrane use with different type of active carbon raw material to the treatment of songket liquid waste which can fulfill the condition of the waste water ready dispose of by water quality standard. Parameters examined TSS, BOD, COD, PH, and turbidity. The contact time used during the filtration process is 30 minutes, 60 minutes, 90 minutes, 120 minutes and 150 minutes. As for the flow rate used 3L / min and 5L / min. From the result of the research, it is known that the best result of waste samples with 150 minutes contact time and 3L / min flow rate.

1. Introduction
Songket is a traditional cloth that comes from South Sumatra region by way of woven. Songket cloth is often used in official events such as weddings, inauguration, the race, etc. Interest in songket cloth is mostly from the middle class and above because the price of this songket own cloth is quite expensive. The cost is expensive because the process takes a while, the fabric and the difficulties of the pattern shape. Along with the increased production of this songket cloth can produce liquid waste from the coloring process. The staining process itself uses chemicals that become environmental pollution. Dyes from waste to waters result in changing water properties. Songket industrial wastewater has become a major problem in environmental impact control in the textile industry. In order to meet the quality standards, liquid waste must be processed in an integrated manner, both produced during the production process and after the production process. The most liquid waste management done by a textile factory is coagulation followed by adsorption of contaminants by passing waste water through zeolite and activated charcoal.

Songket waste water management in washing process aims to minimize the volume, concentration, and waste toxicity. By reducing levels of pollutants from waste that is not good for the environment until the laundry waste is eligible to be discharged into the environment. Toxic substances contained in the waste of songket liquid, if exceeding the threshold can reduce the quality of the surrounding...
environment. Water quality is related to chemical compounds such as organic and inorganic compounds and the presence of microorganisms that play an important role in determining the composition of water. One way to reduce the impact is to use a ceramic membrane with a mixture of activated carbon, bentonite and clay before the songket liquid waste is discharged into the environment. According to Gufta (2008), adsorbents can be used to adsorb waste organic and inorganic compounds. In this study made adsorbent from waste avocado seeds. These ingredients are known to have a good absorption rate so that the attraction for researchers in the selection of adsorbents. Because this waste can interfere with people's smell that can cause odor due to the process of decaying the seeds.

Based on the above description, the researcher conducted research on the production of activated carbon from avocado seeds which tested its effectiveness on adsorption of ceramic membrane in songket liquid water, using process variable that is type of raw material of activated carbon, flow rate and contact time so it will know its influence to quality waste water after processing. In this research, conventional method (non membrane) is used to channel the songket liquid waste into active carbon mixture, bentonite and clay arranged in stages, and compare it using ceramic membrane. Therefore, in this research, we are interested in making the title "Influence of Contact Time, Flow Rate and Type of Active Carbon Raw Materials on Ceramic Membrane Making with Bentonite and Clay Blends for Songket Liquid Waste Processing."

1.1 Avocado
Avocado plants are fruit trees such Avocado plants are fruit trees such as alpuket (West Java), alpokat (East Java / Central Java), boahpokat, jamboopokat (Batak), advocates, jamboo butter, jamboopooan, pookat (Lampung) and others. Avocado plants are from the lowlands of Central America and are expected to enter Indonesia in the 18th century. Indonesia has a mountainous topography and that makes Indonesia have a tropical climate.

1.2 Activated Carbon
Activated carbon or also known as activated charcoal, is a type of carbon that has a very large surface area. This can be achieved by carbonization and activation processes. In the process occurs the removal of hydrogen, gases and water from the carbon surface so that there is physical changes on the surface. This activation occurs due to the formation of an active group due to the interaction of free radicals on the carbon surface with atoms such as oxygen and nitrogen. Usually the activation only aims to enlarge its surface area only.

Activated carbon is composed by carbon atoms that are covalently bonded in a hexagonal lattice. The ability of actively adsorbing carbon is determined by its chemical structure ie chemically bounded C, H, and O atoms forming functional groups.

1.3 Songket Wastewater
Songket liquid waste is textile liquid waste in the form of flexible materials made of woven yarn. The main environmental problem in the textile industry is the waste from the dyeing process. Dyes, heavy metals and high salt concentrations are water pollutants. The main effort that needs to be done to reduce the chemical is the removal of the toxic material from the effluent.

1.4 BOD (Biological Oxygen Demand)
BOD is an empirical analysis that attempts to globally approach the microbiological processes that actually occur in water. BOD is a common parameter used to determine the level of contamination of organic matter in wastewater. BOD checks are required to determine pollution loads from waste water and to design biological treatment systems (G. Alerts and SS Santika, 1987). The presence of a fairly high organic material (indicated by BOD and COD values) causes the microbes to become active and break down the organic material biologically into organic acid compounds.
1.5 COD (Chemical Oxygen Demand)
Chemical oxygen solubility is the oxygen needed to break down organic and inorganic materials, therefore the COD value is greater than the BOD value. This parameter is used for comparison or control of COD values. Because the content of solid waste is generally contained from organic materials, the parameters used are COD. The COD Analysis Method is the KOK or Chemical Oxygen Requirement is the amount of Cr₂O₇²⁻ oxidant which reacts with the test sample and is expressed as mg O₂ for every 1000 ml of the test sample. Organic and inorganic compounds, especially organic in the test sample, are oxidized by Cr₂O₇²⁻ in a closed reflux producing Cr³⁺. The amount of oxidant required is expressed in oxygen equivalent (O₂ mg / L) measured by visible light spectrophotometry. Cr₂O₇²⁻ strongly absorbs at 400 nm wavelength and Cr³⁺ strongly absorbs at 600 nm wavelength. For KOK values of 100 mg/L up to 900 mg / L, an increase in Cr³⁺ was obtained at 600 nm wavelength. In the test sample with higher KOK value, dilution is performed before the test. For KOK values smaller than or equal to 90 mg / L, a reduction of Cr₂O₇²⁻ concentration was determined at 420 nm wavelength.

3. TSS (Total Suspended Solid)
Suspended solids are solids that cause water turbidity, are not dissolved, and can not precipitate directly. Suspended solids consist of particles of lesser size or weight than sediments, eg clay, certain organic materials, micro-organism cells, and so on. The TSS test is a way to test the total amount of soluble solids in a foodstuff. Foods that are washed for too long will cause the loss of nutrients in large quantities, in addition to warming up too long can also cause loss of nutrient content in the foodstuff. The solution is a homogeneous mixture consisting of two or more substances. Substances that are fewer amounts in solution are called soluble substances or solutes, while substances that are more numerous than other substances in solution are called solvents or solvents.

Suspended solids may be organic and inorganic. Solid Suspended substances can be classified once again into, among other, floating solids which are always organic and solids deposited which can be organic and inorganic. The number of suspended solids can be calculated using Gravimetry, suspended solids will reduce the penetration of sunlight into the water so that it will affect the regeneration of oxygen and photosynthesis. Suspended material has an adverse effect on water quality because it can cause water clarity and may affect the ability of fish to see and capture food and block sunlight from entering the water. Suspended deposits may also clog fish gills, preventing eggs from developing. When the suspended solid is calm at the bottom of the water body, it can hide the eggs and there is silting on the water bodies so it requires dredging which requires high operational costs.

4. Turbidity
Turbidity is a measure that describes the effects of light as a basis for measuring the state of standard water by the scale of NTU (nephelometirx turbidity unit) or JTU (jackson turbidity unit) or FTU (formazin turbidity unit). This makes a real difference in terms of aesthetics as well as in terms of water quality itself. Turbidity in water is caused by suspended substances such as clay, mud, organic matter, plankton, and other fine substances. Turbidity describes the optical properties of water determined by the amount of light absorbed and emitted by materials present in water. Turbidity is caused by the presence of suspended and dissolved organic and inorganic materials (eg mud and fine sand), as well as inorganic and organic materials in the form of plankton and other micro organisms.

Substances causing water to become cloudy include clay, sediment (sludge), organic and non-organic matter divided into fine grains, dissolvable organic color mixtures, planktons and microorganisms. Turbidimeter is a tool used as a test instrument standard to determine the level of turbidity of water.
5. pH
Untreated wastewater discharged directly into the water will change the pH of water that can interfere with the life of the organism in the river. Waste water with non-neutral concentration will complicate the biological process, thus disrupting the process of purifying the pH is good for drinking water and wastewater is neutral 7. The pH limit value is 6-9

6. Membrane
Currently the word "membrane" has been expanded to describe a flexible thin sheet or film, acting as a selective separator between two phases because it is semipermeable (Widayanti, N; 2013). Membrane separation process in the form of selective material transfer because of the thrust or drive in the form of differences in concentration, pressure, electrical potential, or temperature. Separation process by using membrane there is liquid-liquid phase separation generally based on particle size and different charge with dive force (diving force) in the form of temperature difference, pressure difference, concentration difference, energy difference, and electric field. The result of separation is retentat (Mulder, 1996). Based on the origin of the membrane is divided into natural and synthetic membranes. The natural membrane is usually made from cellulose and its derivatives such as cellulose nitrate and cellulose acetate. While examples of synthetic membranes such as polyamide, polysulfone and polycarbonate (Widayanti, N; 2013). Based on the pressure used as a force, the membrane can be classified into several types:
   a) Microfiltration
      In the microfiltration membrane, salts can not be rejected by the membrane. The filtration process can be carried out at relatively low pressure that is below 2 bar. Microfiltration membranes are made from a wide variety of both organic and inorganic materials. Inorganic membranes are widely used because of their resistance to high temperatures.
   b) Ultrafiltration
      The ultrafiltration process lies Between nanofiltration and microfiltration processes. Pore membrane size ranges from 1 μm to 1 nm. Ultrafiltration is used to separate macromolecules and colloids from the solution. The ultrafiltration membrane and microfiltration are porous membranes in which solute rejection is strongly influenced by the size and weight of the solute relative to the pore size of the membrane. The size of the molecule that can pass through the ultrafiltration membrane ranges from 104 to 98 dalton (Mulder, 1996).
   c) Reverse Osmosis
      Reverse osmosis membranes (reverse osmosis) are used to separate low molecular weight solutes such as inorganic salts or small organic molecules such as glucose and sucrose from the solution. More dense membranes (smaller pore size and lower surface porosity) with greater hydrodynamic resistance are required in this process. this causes the operating pressure on reverse osmosis to be very large to produce the same flux as microfiltration and ultrafiltration processes. In general, the reverse osmosis membrane has an asymmetric structure with a thin, solid top layer and a 50 to 150 μm support matrix. The resistance is determined by a dense top layer The ultrafiltration process (UF) lies between nanofiltration and microfiltration processes. Pore membrane size ranges from 0.05 μm to 1 nm. Membrane characteristics are generally expressed in Molecular Weight Cut Off (MWCO), or molecular weight denied by the membrane. The molecular weight that can be rejected by the ultrafiltration membrane ranges from 104 to 108 Dalton. In principle, ultrafiltration membranes are used to separate macromolecules and colloids from the solution.

7. Research methodology

7.1. Tool
   1) Analytical Balance
   2) Filter
   3) Vacuum Pumps
4) Plastic Bucket
5) Plastic Hoses 1m
6) Furnace
7) Filter Paper
8) Bottle
9) Oven
10) Beaker Glasses
11) Ceramic Membrane
12) Cutting mills
13) Flowmeter
14) Housing Membrane

7.2. Material
1) Songket Liquid Waste
2) KOH solution 5%
3) Avocado seeds
4) Conventional Active Carbon (Market)
5) Clay
6) Aquadest
7) Bentonite
8) Zeolite
9) Silica Sand

7.3. Research variable
1) Independent variables:
2) Flow rate of 3L / min and 5L / min
3) Contact time (30 minutes, 60 minutes, 90 minutes, 120 minutes, and 150 minutes).
4) Type of raw material activated carbon from avocado seeds
5) Variable fixed: Songket Waste 20 Liter

7.4. Research procedure

7.4.1. Making of activated carbon
1) Collect avocado seed waste for the preparation of raw materials to make activated carbon for research and make sure it is in good condition also ready for use.
2) Avocado seeds washed first to clean the rest of the meat durian fruit and dirt.
3) Cut the avocado seed into a smaller size so that in the oven heating evenly.
4) Eliminate the water content of raw materials using an oven with a temperature of 100ºC for 1 hour.
5) Carbonize raw material of activated carbon with furnace at 500 ºC for 1/2 hour.
   a. Then milled using a grinder tool until smooth into a powder, then sieved by using sieving to get the desired mesh size of 60 mesh.
   b. Activate by immersion of activated carbon in 5% KOH solution for 24 hours, then filtered and washed until the pH is neutral.
   c. Drying of activated carbon by using Oven to dry.

7.4.2. Housing membrane use procedure
1) Preparation of tools and materials for research, ensuring the availability of materials (waste samples) in good condition and tools ready for use.
2) Filter the songket liquid waste so that the solid particles are not elbowed. Next filter the waste and take a clear for running.
3) Pretreatment of songket liquid waste by adsorption using plastic bottles with activated carbon, zeolite and silica sand as adsorbent.

4) Insert the water first to calibrate the equipment, the length is about 30 minutes

5) At 31 minutes open the tap to take permeate water to be used later to calculate the JW (flux water) for one minute.

6) Close the tap that was opened earlier and move the sample from water into songket liquid waste at minute 32.

7) After 30 minutes, in the 63rd minute open the tap again for one minute for the sample to be analyzed.

8) At 64 minutes close the tap and do as to 5.

9) Do the same (steps 5, & 9) repeatedly with the specified time variable.

10) During the research record the required data.

7.4.3. Sample measurements

In the sample measurement conducted at PT.Sucofindo Palembang. Parameters tested were BOD, COD, TSS, Turbidity and pH.

8. Result and discussion

8.1. Effect of Ceramic Membrane Raw Material on songket liquid waste

From the research results obtained data as follows:

![Graph showing pH changes](image)

Figure 1. The pH graph for ordinary activated carbon

Figure 1 shows the pH graph for ordinary activated carbon where before discussing the graph data, we must know first that the range for the Ph value is about 6-9. For a neutral Ph value 7. The above graph shows orange color for 5L / Min flow rate, blue for 3L / Min flow rate with contact time 30, 60, 90, 120, and 150 minutes. For the first graph data shows with time 30 minutes, the flow rate of 3L / Min with the value of 9.1 which is lower than the 5L / Min flow rate which has a value of 9.28. 3L / Min shows it has a better value because it approaches the neutral Ph value. Furthermore, for 60 minutes at 3L / Min flow rate is also better than the 5L / Min flow rate where the flow rate of 3L / Min 8.54 and 5L / Min 8.63. Furthermore, for 90 minutes contact time 3L / Min flow rate better than 5L / Min flow rate where the value of 3L / Min 7,9 while 5L / Min 7,98. For 120 minutes contact time with 3L / Min flow rate better than 5L / Min flow rate because 3L / min value 7.56 and value 5L / Min 7.72. While for contact time 150 minutes with flow rate 3L / Min 7,39 and 5L / Min 7,41. Where the value for 3L / Min flow rate is better than 5L / Min flow rate.
Figure 2. The pH graph for ordinary activated carbon

Figure 2 show graph of pH of activated carbon of avocado seed with contact time 30 minutes 3L / Min flow rate has value 8.45 and 5L / Min 8.77 where value with 3L / Min flow rate better than 5L / Min flow rate. For 60 minutes contact time the flow rate 3L / Min 7.93 and 5L / Min 8.39 where the value with 3L / Min flow rate is also better than the value of 5L / Min. For 90 minutes contact time with flow rate 3L / Min 7.59 and 5L / Min 7.89 where value with 3L / Min flow rate better than 5L / Min. Then for 120 minute contact time with 3L / Min 7.25 and 5L / Min 7.54 flow rate better 3L / Min flow rate than 5L / Min flow rate. Whereas for 150 minute contact time where flow rate 3L / Min 6.8 and flow rate 5L / min 7.23, 3L / Min flow rate better than 5L / min value due to neutral pH value.

Figure 3. TSS graph of active activated carbon

Figure 3 show TSS graph of active activated carbon with a contact time of 30 minutes 3L / Min flow rate has a value of 215 while the flow rate of 5L / Min has a value of 234, it can be concluded that the value with 3L / Min flow rate is better than 5L/ Min. Next contact time 60 minutes flow rate 3L / Min has a value of 181 while the flow rate of 5L / Min has a value of 198, it can be concluded that the value with 3L / Min flow rate is better than 5L / Min. Next 90 minutes contact time 3L / Min flow rate has a value of 145 while the flow rate of 5L / Min has a value of 163, it can be concluded that the value with 3L / Min flow rate is better than 5L / Min. Next contact time 120 minutes flow rate 3L / Min has a value of 112 while the flow rate of 5L / Min has a value of 127, it can be concluded that the value with 3L / Min flow rate is better than 5L / Min. Next contact time 150 minutes flow rate 3L / Min has a value of 80 while the flow rate of 5L / Min has a value of 95, it can be concluded the value with flow rate 3L / Min better than 5L / Min.
Figure 4. TSS chart of activated carbon of avocado

TSS chart of activated carbon of avocado seeds with contact time of 30 minutes 3L / Min flow rate has a value of 140 while the flow rate of 5L / Min has a value of 177, it can be concluded that the value of 3L / Min flow rate is better than 5L / Min. Next contact time 60 minutes flow rate 3L / Min has a value of 125 while the flow rate of 5L / Min has a value of 148, it can be concluded that the value with 3L / Min flow rate is better than 5L / Min. Next 90 minutes contact time 3L / Min flow rate has a value of 97 while the flow rate of 5L / Min has a value of 127, it can be concluded that the value with 3L / Min flow rate is better than 5L / Min. Next contact time 120 min 3L / Min flow rate has a value of 71 while the flow rate of 5L / Min has a value of 93, it can be concluded that the value with 3L / Min flow rate is better than 5L / Min. Next contact time 150 minutes flow rate 3L / Min has a value of 43 while the flow rate of 5L / Min has a value of 68, it can be concluded that the value with 3L / Min flow rate is better than 5L / Min.

Figure 5. Graph COD of active activated carbon

Graph COD of active activated carbon with contact time of 30 minutes 3L / Min flow rate has a value of 99.30 while the flow rate of 5L / Min has a value of 112.87, it can be concluded that the value with 3L / Min flow rate is better than 5L / Min. Next contact time 60 minutes flow rate 3L / Min flow rate has a value of 86.15 while the flow rate of 5L / Min has a value of 97.03, it can be concluded that the value with 3L / Min flow rate is better than 5L / Min. Next 90 minutes contact time 3L / Min flow rate has a value of 74.87 while the flow rate of 5L / Min has a value of 84.13, it can be concluded that the value with 3L / Min flow rate is better than 5L / Min. Next contact time 120 minutes flow rate 3L / Min has a value of 69.20 while the flow rate of 5L / Min has a value of 71.26, it can be concluded that the value with 3L / Min flow rate is better than 5L / Min. Next contact time 150 minutes flow rate 3L / Min has a value of 63.84 while the flow rate of 5L / Min has a value of 65.19, it can be concluded that the value with 3L / Min flow rate is better than 5L / Min.
Graph COD activated carbon avocado seeds with contact time 30 minutes flow rate 3L / Min has a value of 80.88 while the flow rate of 5L / Min has a value of 96.40, it can be concluded that the value with 3L / Min flow rate is better than 5L/Min. Next contact time 60 minutes flow rate 3L / Min has a value of 72.04 while the flow rate of 5L / Min has a value of 88.29, it can be concluded that the value with 3L / Min flow rate is better than 5L / Min. Next 90 minutes contact time 3L / Min flow rate has a value of 65.93 while the flow rate of 5L / Min has a value of 76.11, it can be concluded that the value with 3L / Min flow rate is better than 5L / Min. Next 120 minutes contact time 3L / Min flow rate has a value of 60.28 while the flow rate of 5L / Min has a value of 67.35, it can be concluded that the value with 3L / Min flow rate is better than 5L / Min. Next contact time 150 minutes 3L / Min flow rate has a value of 56.11 while the flow rate of 5L / Min has a value of 59.81, it can be concluded that the value with 3L / Min flow rate is better than 5L/Min.

Graph of normal active carbon BOD with contact time of 30 minutes 3L / Min flow rate has a value of 80.11 while the flow rate of 5L / Min has a value of 77.13, it can be concluded that the value with 3L / Min flow rate is better than 5L/Min. Next contact time 60 minutes flow rate 3L / Min has a value of 65.20 while the flow rate of 5L / Min has a value of 68.88, it can be concluded that the value with the flow rate of 3L / Min is better than 5L / Min. Next 90 minutes contact time 3L / Min flow rate has a value of 56.13 while the flow rate of 5L / Min has a value of 57.32, it can be concluded that the value with 3L / Min flow rate is better than 5L / Min. Next contact time 120 min 3L / Min flow rate has a value of 47.84 while the flow rate of 5L / Min has a value of 49.86, it can be concluded that the value with the flow rate of 3L / Min is better than 5L / Min. Next contact time 150 minutes 3L / Min flow rate has a value of 41.93 while the
flow rate of 5L / Min has a value of 43.17, it can be concluded that the value with 3L / Min flow rate is better than 5L / Min.

![Figure 8. Graph of BOD of activated carbon of avocado](image)

Graph of BOD of activated carbon of avocado seed with contact time 30 min 3L / Min flow rate has value 63.97 while 5L / Min flow rate have value 67.07, it can be concluded value with 3L / Min flow rate better than 5L / Min. Next contact time 60 minutes 3L / Min flow rate has a value of 56.28 while the flow rate of 5L / Min has a value of 59.13, it can be concluded that the value with 3L / Min flow rate is better than 5L / Min. Next 90 minutes contact time 3L / Min flow rate has a value of 49.03 while the flow rate of 5L / Min has a value of 53.84, it can be concluded that the value with 3L / Min flow rate is better than 5L / Min. Next contact time 120 min 3L / Min flow rate has a value of 42.39 while the flow rate of 5L / Min has a value of 46.55, it can be concluded that the value with 3L / Min flow rate is better than 5L / Min. Next contact time 150 minutes flow rate 3L / Min has a value of 36.15 while the flow rate of 5L / Min has a value of 40.27, it can be concluded that the value with 3L / Min flow rate is better than 5L / Min.

![Figure 9. Graph of normal activated carbon turbidity](image)

Graph of normal activated carbon turbidity with contact time of 30 minutes 3L / Min flow rate has a value of 43.45 while the flow rate of 5L / Min has a value of 43.29 can be inferred the value with 3L / Min flow rate is better than 5L / Min. Next contact time 60 minutes 3L / Min flow rate has a value of 37.64 while the flow rate of 5L / Min has a value of 35.40, it can be concluded the value with 5L / Min flow rate is better than 3L / Min. Next 90 minutes contact time 3L / Min flow rate has a value of 30.91 while the flow rate of 5L / Min has a value of 27.89, it can be concluded the value with 5L / Min flow rate is better than 3L / Min. Next contact time 120 min 3L / Min flow rate has a value of 20.58 while
the flow rate of 5L / Min has a value of 19.28, it can be concluded the value with 5L / Min flow rate is better than 3L / Min. Next contact time 150 minutes flow rate 3L / Min has a value of 15.17 while the flow rate of 5L / Min has a value of 15.73, it can be concluded the value with 5L / Min flow rate is better than 3L / Min.

Figure 10. Graph Turbidity activated carbon avocado

Graph Turbidity activated carbon avocado seeds with contact time 30 minutes flow rate 3L / Min has a value of 39.07 while the flow rate of 5L / Min has a value of 41.38, it can be concluded that the value with 3L / Min flow rate is better than 5L / Min. Next 60 minutes contact time 3L / Min flow rate has a value of 31.93 while the flow rate of 5L / Min has a value of 32.88, it can be concluded that the value with 3L / Min flow rate is better than 5L / Min. Next 90 minutes contact time 3L / Min flow rate has a value of 25.46 while the flow rate of 5L / Min has a value of 26.17, it can be concluded that the value with 3L / Min flow rate is better than 5L / Min. Next contact time 120 minutes 3L / Min flow rate has a value of 18.61 while the flow rate of 5L / Min has a value of 18.96, it can be concluded that the value with 3L / Min flow rate is better than 5L / Min. Next contact time 150 minutes 3L / Min flow rate has a value of 13.85 while the flow rate of 5L / Min has a value of 14.03, it can be concluded that the value with 3L / Min flow rate is better than 5L / Min.

9. Conclusion
Based on research conducted can be concluded that:
1) The greater the mass of avocado seeds the greater the adsorption power of songket waste.
2) The longer the contact time the more waste is absorbed. The optimum contact time of adsorption in songket waste water was 150 minutes with 3L / min flow rate, with ceramic membrane composition of 5% activated carbon of avocado seed, 20% bentonite and 75% clay.
3) The results of the turbidity test obtained an initial rate of 95.65 NTU while for the final rate obtained 13.85 NTU.
4) The adsorption capacity of songket waste using ceramic membrane made from activated carbon of avocado seeds is better than using conventional or conventional activated carbon. Can be seen from the test results of each sample and each analysis of pH, TSS, BOD, COD, and Turbidity.

10. Suggestions
1) Selection of avocado seeds as activated carbon is highly recommended for future researchers. It would be better if the amount of activated carbon avocado seeds added as a composition of ceramic membrane raw materials.
2) Flow rate and contact time greatly affect the process of waste absorption, therefore for the researchers further increase the number of variations of flow rate and contact time of at least 2 or more.
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