Determination of rate chloride (Cl-) with Argentometric Mohr on Drinking Water Refill Tidiness in the Village Purwodadi Districts Kras Regency Kediri

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Abstract: Water is a basic necessity in human life, water consists of mineral elements, one of which is chloride. If chloride in water is too much, it can cause water quality degradation causing the water to be not suitable for irrigation and human need. The aim of this study is to find out if the chloride content in drinking water refill in Purwodadi-Kras Kediri village has met the requirement as per PERMENKES RI NO 492 / MENKES / PER / IV / 2010 or not. The study uses quasi experiment design method, the sample was collected through non-random sampling technique. The samples are analyzed by using argentometric mohr method with standard solution of $AgNO_3$ and indicator K_2CrO_4, end point marked by the formation of Ag_2CrO_4 red brick. The results of this study show that chloride content (Cl^-) contained in drinking water refill packing in the village of Purwodadi Kras-Kediri was to 7.32 Mg/L. This study concludes that the chloride content in drinking water refills in the village Purwodadi-Kras Kediri has met the requirements of PERMENKES RI NO 492 / MENKES / PER / IV / 2010, which is more than 250 mg/L.

1 INTRODUCTION

Water is basic needs of human life and its function cannot be replaced by another compound (F. G. Winarno 1986). Drinking water is not only the problems related to available or failure water but also the quality of waters available. The indications of clean drinking water are colourless, odourless, tasteless (salted, acid), not contains a chemical that endangers, does not contain are bacterium causing a disease and forth (T. Gilarso, 2004). In a body of water useful as soluble substance food substance, digest food, and regulating body temperature. The human body is composed of 60-70 % water, under normal circumstances the human body need 2.5 litres of water every day. Water consisting of non-metallic minerals required by man for development or physical growth man, several chemical elements that are contained in water covering Ca, Mg, Cl, Fe and so on.

Water also has a role so long, including as a means of transport digestion food to the network, as transport leftovers to terminal as shelter kidneys and out as urine, as a supplement hormone be produced by the enzyme. bearing heat its surface of the skin out as sweat (Hertog Nursanyoto, 1992).

Those compounds subjected to the process of dissociation in water so as to form ions. The ion also cannot be oxidized under normal circumstances and not in nature are toxic, but if excess salt chloride can result in a decrease in the quality of water so that the water unfit for irrigation and to meet domestic life (Achmad Rukaesih, 2004).

The village of purwodadi districts Kras regency Kediri, for packaged drinking water are very popular among all these the village community, since their prices relative affordable and then be used as an alternative form of drinking water for some of the residents without regard to the quality of water what is happening to them. Becomes one of the requirements standart drinking water would have to fulfill standart physics, bacteriology, as well as standart chemical, one of which is the womb chloride (Cl^-) that does not be sold more than 250 mg/l. those conditions are in accordance with

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2 SUBJECTS AND METHODS

In this study the required sample is 3 (three) samples. The sample used is drinking Water Tidiness of Refill the Village Purwodadi Districts Kras Regency Kediri.

2.1 Experiment Design

This research included in experimental research, design of this research is cross sectional.
The tools used:

- Erlenmeyer 250 ml
- Pipette 100 ml
- Micro burette 25 ml
- Macro burette 50 ml
- Measuring cup 100 ml
- Volumetric flask 100 ml, 250 ml (SNI 01-3554-2006).

Material used :

- Refill drinking water in the village
- Potassium chromate indicator K_2CrO_4 5%
- Standard silver nitrate solution ($AgNO_3$) 0,01 N
- Standard sodium chloride solution NaCl 0,01 N
- Solution of sodium hydroxide NaOH 1 N
- Sulfuric acid solution H_2SO_4 1N (SNI 01-3554-2006)

The research was conducted in a chemical analysis of food and drink an academy health analyst IIK bhakti wiyata Kediri.

2.2 Method of collecting data

- A method the sample collection by taking of each place 1500 ml and placed on the receptacle clean
- After a sample was taken in accordance with the provisions 100 ml procedure

Qualitative Analysis of Cl^- :

- Test $AgNO_3$
- Taken 3 drops of sample solution into a test tube
- Plus the solution of argentum nitrate ($AgNO_3$) will occur white deposits
- The precipitate dissolves in a dilute solution of ammonium hydroxide (NH_4OH), and with the addition of dilute nitric acid (HNO_3) solution a white precipitate will occur again (Bassett, 2005).

Quantitative Analysis using titration Argentometry method Mohr :

1. Standardization of AgNO with NaCl
   - Measure carefully 25 ml of 0.01 N NaCl into 250 ml Erlenmeyer
   - Add 1 ml of 5% K_2CrO_4 indicator 2-3 drops into Erlenmeyer which contains 0.01 N NaCl until it becomes reddish yellow.
2. Determination of Chloride Level
   - Measure carefully 100 ml in pH 7-10, if it is not within the pH range, add H_2SO_4 1N or 1N NaOH to pH 7-10.
   - Add 1 ml of 5% K_2CrO_4 indicator
   - Titrate with 0.01N silver nitrate ($AgNO_3$) standard solution to form a reddish yellow color.
   - Perform blank titration by measuring carefully 100 ml of distilled water and then working with the treatment
   - Do duplo work
   - Calculate chloride content (Cl^-) with SNI 01-3554-2006

Calculation Standard

$$levels\ Cl^- = \frac{(A - B) \times N \times 35450}{V}$$

2.3 Statistical analysis

The data is subjected to statistical analysis using the statistical descriptive. Statistic descriptive is used to calculate the average volume of NaCl and $AgNO_3$.

3 RESULTS

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Table 1: Qualitative Test

No	Test	Literature	Observation	Result
1	$AgNO_3$	White sediment	White sediment	+
2	NH_4OH	White sediment disappear	White sediment disappear	+
3	HNO_3	White sediment formed again	White sediment is formed again	+

Table 2: Result of determing Cl^-

No	Sample Volume (mL)	Volume $AgNO_3$ (mL)	Average Volume (mL)
1	100,0	6,240	6,244
2	100,0	6,240	
3	100,0	6,240	
4	100,0	6,240	
5	100,0	6,240	

4 DISCUSSION

Drinking water is safe for health when it meets the physical, microbiological, chemical and radioactive requirements contained in mandatory parameters and additional parameters set out in PERMENKES RI NO. 492 / MENKES / PER / IV / 2010 concerning drinking water requirements and supervision that clean drinking water not based on clarity alone but rather the normal limit of the compound or mineral elements contained therein. (RI 2010). Chloride in the form of ions is one of the many inorganic anions present in water and waste (Pudjianto 1984). In the urine body also contains chloride salt is ± 1% while well water contains high chloride content, it means that the well water has been contaminated by the urine (Surbakty 1987). A qualitative analysis is to know that the chloride in sample water. It uses the following mechanism :

- Test $AgNO_3$

$$Cl^- + AgNO_3 \rightarrow\downarrow_{putih} AgCl + NO_3 -$$

While quantitative analysis in determining levels of chloride on drinking water refills uses the argentometri mohr. It uses aregntometri mohr in the analysis, because argentometri mohr functions to determine bromide levels and chloride.

a. Test K_2CrO_4

$$2AgNO_3 + K_2CrO_4 \rightarrow\downarrow_{merah\ bata} Ag_2CrO_4 + 2KNO_3$$

b. Test $BaCO_3$

$$BaCO_3 + 2H^+ \rightarrow Ba^{2+} + CO_2 \uparrow + H_2O$$

The principle of the application of chloride levels uses the method argentometry mohr is in solution neutral or slightly alkaline, silver ions with an ion klorisa react in a quantitative manner. Titration ends with establishment of silver chromatic that is coloured red of silver chromate of this can be explained clearly to the reaction, as it follows:

- $Cl^- + AgNO_3 \rightarrow AgCl + NO_3 -$
- $2AgNO_3 + K_2CrO_4 + \rightarrow\downarrow_{merah\ bata} Ag_2CrO_4 + 2KNO_3$

At the beginning of titration happened precipitate silver chloride and after reached point equivalence, so the addition of a little silver nitrate will react with chromate , by forming precipitate silver chromate that is colored red.

5 CONCLUSIONS

Based on the results of inspection of drinking water refill packaging contained in the village Purwodadi Kediri Argentometri Mohr method obtained results 7.32 mg/L. from the data it is concluded that chloride content at drinking water refill packing circulating in purwodadi village of Kediri still fulfill the requirement from PERMENKES RI NO 492/MENKES/PER/IV/2010 that can not be more than 250 mg/L.

6 RECOMMENDATION

- Need to pay attention to factors that may affect the titration result.
- For producers pay more attention to the quality of drinking water refill packs that are produced before being distributed in the community.
- For people to be more careful in choosing drinking water for daily consumption.

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