

An Initial Study Of The Air Pollution Through Rainwater In An Industrial Area Of Bekasi

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ABSTRACT

This study aims to determine the level of acidity in the rainwater in the industrial area of East Jakarta. The research was done by using a multimeter (Waterproof Tester). With these tools, it can be seen pH and temperature in the rainwater. The results shown that the rainwater in the area of Bekasi tends to be normal because it is still in the average and standard. Although these areas are industrial areas, airports, and many transportation passes, the industrial area still have green places.

Keyword: acidity, air pollution, Bekasi, industry, rainwater

1. INTRODUCTION

Rain plays an important role in the cycle of dissolving chemicals. Acid rain is one indicator of air pollution (Tuti, 2009). Pollutants released by sources such as pollution emissions and transportation industries results will affect the quality of rainwater. Clean water generally has a pH of 6-7 while the water contaminated by acid or what is known as acid rain has a pH of less than 6 (Ja'far, 2009).

Trade, industry and education is so rapid in the city of Bekasi caused the number of city population increases. The number of residents in the city of Bekasi led to the need of transportation have also increased resulting in increased fuel consumption and polluting the air. The acids contained in rainwater are carbonates, nitrates and sulfates. These acids are secondary pollutants as a result of chemical reactions in the atmosphere from primary pollutants CO₂, NO₂, SO₂ coming from the combustion process (Hocking, 2016; Qu and others, 2016; Tang, 2016).

The increasing CO₂ in the atmosphere causes the pH of rain fell up to 5.6 even though no cause of acid rain pollutant sources other. SO₂ present in low concentrations in the atmosphere, but it has a dissociation constant and huge water solubility (Qu and others, 2016; Stauffer, 2013). Acid rain will be over in case of a reaction with nitrogen oxides. NO₂ and SO₂ is a

source of acid rain. In the modern age where the total population is increasing and more and more dense, to meet the needs of biological and technological advances, the activities that disrupt the balance of growth for recycled materials is increasing (Kesehatan and Misikin, 2005; Purwanto, 2012; Resosudarmo and Napitupulu, 2004; Situmorang, 2007).

In order to prevent or reduce or eliminate the consequences is too great influence of the environment caused by air pollution, it should be their self-awareness of each person to always take care of the environment and protecting the environment and also for the welfare of life, such as a green spot in the industrial area (Izzati and Poerwanti, 2014; Purwanto, 2012). In the other hand, the issues of the low education level for Indonesian and the high number of the social welfare in the society have to followed by the growth of the industrial area (Izzati and others, 2015a; Izzati and others, 2015b).

This study has been conducted research on the effect of pollutant emissions, namely CO₂, SO₂ and NO₂ on the pH of rainwater that identify the occurrence of acid rain in the city of Bekasi. The purpose of the study is to analyze gas emissions from fuels and vehicles industry to the potential of acid rain in the city of Bekasi.

2. METHODS

2.1. Place and Time

Rain water sampling is done randomly in some areas in the city of Bekasi. In one day do some sampling at different times. Then the rain water in a test done by a device called a pH meter. The study was conducted as many as 22 days from the date of 7 March 2016 to 22 March 2016.

2.2. Tools

1. PH METER

To measure the pH (acidity or alkalinity) of a liquid.

2. WATER CONTAINER

This container as a place / container rainwater that will be tested with a pH meter, could use a glass or the like.

3. RESULT AND DISCUSSION

Bekasi City is a populated area for vehicles and also a lot of factories and household industries. Based on observations of BMKG HalimPerdanaKusuma in 2014 the state of rainwater in the city of Bekasi influenced by factories and vehicles. As we know that in the area of Bekasi city vehicles more rapidly, and could affect the acidity of rainwater in the city of Bekasi.

As shown in Fig. 1 and 2, the measurement of rainwater was measured using a scale of pH and temperature by using a pH meter and a container to collect the rain water, the city of Bekasi have enough acid rain is worrying because the rain pH of 5.6, which means acid, while normal rain has a pH of 6. This is because many factories are active and exhaust emissions from vehicles. The higher degree of acidity of an acid rain, it will be a bad impact on the environment, such as increasing the concentration of certain metals in areas of acid rain, because the acidity will affect the solubility of metals available.

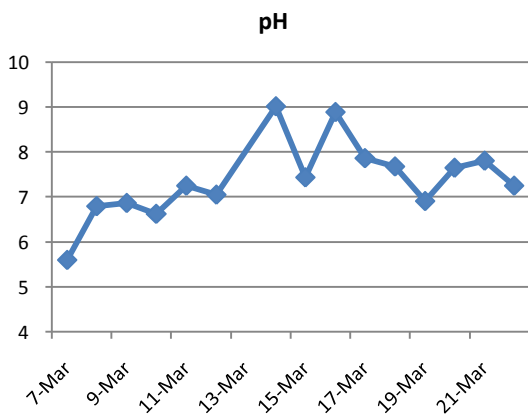


Fig. 1. pH results

Based on the data collection, it can also be seen from the graph shown above, Bekasi city area is quite worrying acid rain on Monday, 7 March 2016 at the pH reached 5.6 at a temperature of 27.1. This is because the number of active factories that dump gas like smoke from factories and also the number of vehicles that get rid of gas emissions that produce acid rain.

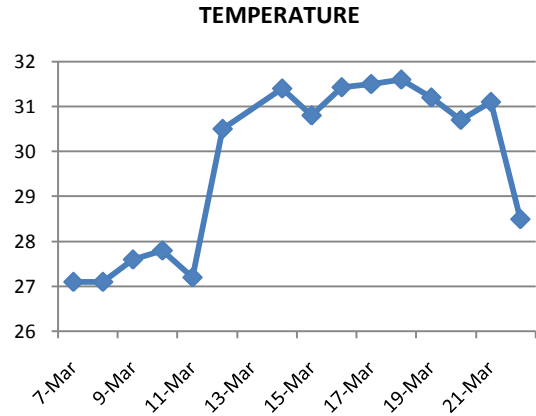


Fig. 2. Temperature

The negative impact on the lake will result in at least the last species. The acid rainwater dissolves the nutrients of the soil together would sweep the compound before the trees can use it to grow, corrosion and cause the disruption of human health.

However, the impact of air pollution is not only for the environment, but for people surrounding it. Most of the people in Bekasi are a worker in industrial area. Thus, they will attract to the pollution day and night, in the workplace and as well as in their house. This condition needs the attention of the local government to find the solution for green and healthy life.

4. CONCLUSION

The observation of the level of acidity in the rainwater in the area of Bekasi, the rain water is normal, so the Bekasi area safe for occupancy. Although the area many industrial areas and airports are also many means of transportation but many places passed through reforestation in the area. Therefore elapsed areas in Bekasi is safe from the level of acidity in rainwater.

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