ABSTRACT

Air pollution is a serious problem that threatens the air quality around us. It can trigger air quality degradation and adversely affect the environment. In the context of ambient air pollution, air pollutants can undergo rainout and washout processes, where they mix with rainwater and eventually affect the quality of rainwater. One of the constituents affected by air pollution in rainwater is heavy metals, which can come from various sources such as industry, volcanic activity, and vehicle exhaust. Emissions from these sources can damage rainwater quality. Although previous studies have been conducted to measure heavy metal concentrations using $PM_{2.5}$ and river water samples, there is still no real-time measurement of heavy metal concentrations in rainwater, which has potential impacts on human health. To address this issue, a rainwater quality measurement system has been developed with parameters such as pH, conductivity, rainfall, and water temperature controlled at 25 ± 1 °C. The Total Dissolved Solids (TDS) parameter will also be added to the system to measure the pollutant content in rainwater. In addition, an automatic opening and closing system will be added to the system to prevent contamination of the rainwater that could affect the quality of the measured rainwater. The washout and rainout processes allow rainwater to wash away pollutants in the air and bring them to the surface, including $PM_{2.5}$ compounds and heavy metals. This research involves real-time measurements of rainwater quality for 31 days with details of 6 rainy days at two measurement stations at Telkom University, namely GKU station and TULT station. The results of these real-time measurements were compared with the thresholds set by BMKG and government regulations to evaluate the quality of rainwater in terms of physics and chemistry. Laboratory test results are also used as a comparison for rainwater quality in terms of heavy metal content by referring to the standards of the Minister of Health Regulation of the Republic of Indonesia No.32 of 2017. The results of real-time measurements and laboratory tests show that the quality of rainwater around the measurement location is still relatively good.

***Keywords**: Air pollution, rainwater quality, heavy metals.*