



Assessment of Sulphur Dioxide Levels in Selected Sites in Athi River, Kenya

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ABSTRACT

Industrialization, economic growth, urbanization and population growth have been responsible for air pollution in developing countries. The discharge of harmful chemicals and increased combustion of fossil fuels, affect both the physical environment and the public health. Air pollution effects are both acute and chronic on human health, ranging from minor upper respiratory irritation to chronic respiratory and heart disease, lung cancer, acute respiratory infections in children and chronic bronchitis in adults. A study was conducted to assess the effect of sulfur dioxide on air quality at three sites in Athi River town, Kenya which included one non-industrial site. The air samples were collected by scrubbing them through appropriate trapping solutions and subsequently analyzed in the laboratory using colorimetric method. The meteorological parameters namely; temperature, relative humidity, wind speed and wind direction were also measured during the sampling exercise. The mean concentrations of sulphur dioxide at the various sampling sites during rainy season were: Shalom Hospital (602 $\mu\text{g}/\text{m}^3$);

Vannilaz Restaurant (793 $\mu\text{g}/\text{m}^3$); Redeemed Gospel Church (861 $\mu\text{g}/\text{m}^3$) and Sabaki residential Estate (370 $\mu\text{g}/\text{m}^3$). The levels exceeded the guidelines recommended by WHO which has set a maximum of 500 $\mu\text{g}/\text{m}^3$, for 10 minutes exposure, however the levels at Sabaki residential Estate were low. Mean

concentrations of sulphur dioxide during the dry season for Shalom Hospital, Vanillaz Restaurant, Redeemed Gospel church and Sabaki residential Estate were 863, 875, 862 and 664 $\mu\text{g}/\text{m}^3$ respectively. The elevated levels of SO_2 was associated with heavy vehicular traffic and the various industrial activities mainly cement manufacturing plants. Sulphur dioxide may also be emitted from diesel-powered vehicles and coal burning in the industries. The study revealed that Shalom Hospital, Vanillaz Restaurant and Redeemed Gospel Church were polluted with sulphur dioxide during the rainy season except Sabaki residential Estate but during the dry season all the sites were polluted with sulphur dioxide.

Keywords: Air pollution, parameters, Industrial sites, WHO standards

1. INTRODUCTION

Air pollution is defined as the presence of any solid, liquid or gaseous substance including noise and radioactive radiation in the atmosphere in such concentration that could harm the health of humans and animals, or could damage plants and materials. (Alias et al, 2007). Sources of air pollution are categorized as either anthropogenic (caused by human activities like coal combustion, industries and exhaust fumes) or biogenic (caused by dust storms and