

Evaluation of SO₂ Concentration in Industrial Area and Urban Area in Klang Valley

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Structured Abstract

Background: Air pollution shows some health and environmental challenges especially in rapidly urbanising and industrialising areas like Klang Valley. Sulfur dioxide, SO₂ especially produced through fossil fuel combustion in vehicles and industrial activities is a key pollutant of concern due to its harmful effects on human health and air quality. This study aims to evaluate and compare the SO₂ concentrations between an industrial area in Petaling Jaya and an urban area in Putrajaya throughout year 2023.

Methods: The study utilized secondary air quality data for the year 2023 collected from the Department of Environment (DOE). In this study pollutant parameters (SO₂, NO₂, NO_x, NO, O₃, CO, PM₁₀, PM_{2.5}) and environmental parameters (wind direction, wind speed, relative humidity and ambient temperature) were used. Statistical analysis such as descriptive statistics, time series analysis was applied in order to determine the underlying patterns and the relationships between pollutant and environmental parameters across different monitoring stations. This approach helps to assess spatial-temporal variability and support data-driven decision-making for air quality management.

Results: The result showed that Petaling Jaya with industrial activity experienced consistently higher average SO₂ concentrations and more frequent episodic peaks compared to Putrajaya. SO₂ concentration in Petaling Jaya frequently approached or exceeded acceptability limits especially during weekdays and industrial operating hours reflecting strong influence from manufacturing emissions. In contrast, Putrajaya recorded lower and more stable SO₂ values to strict urban planning and the absence of significant industrial sources. Seasonal analysis revealed that meteorological factors like wind direction and temperature shows the spatial distribution of SO₂ with both areas showing higher concentrations during periods of atmospheric.

Conclusion: In conclusion, spatial and temporal assessment of SO₂ across different land use in Klang Valley underscores the importance of targeted air quality regulations in industrial areas. The findings provide empirical evidence to guide policymakers in developing region specific mitigation strategies to protect public health and environmental quality.

Keywords: SO₂, Industrial Area, Urban Area, Klang Valley, Air Pollution

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