

Winai Meesang 2006: Variation of Sulphurdioxide Concentration on Bangkok Mass Transit System Route. Master of Science (Environmental Science), Major Field: Environmental Science, College of Environment. Thesis Advisor: Assistant Professor Prapassara Nilagupta, Ph.D.
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Bangkok Metropolis is confronting even more severe traffic congestion problem resulting from limited roads that are not able to accommodate the continually increasing number of motor vehicles. The sky train of the Bangkok Mass Transit System is one of a commute alternatives to alleviate this problem. However, the question exists if the elevated structure affects the ambient air quality. Sulfur dioxide gas concentration, emitted from vehicle exhaust, is particular of interest due to its potential cause of acid rain. Therefore, the aims of this research were to study the change of SO_2 concentration and its effect on pH of rainwater. SO_2 Analyzer: M100E and Ultrasonic Anemometer were used to measure SO_2 concentration and wind speed and direction respectively. The data were collected 24 hour continuously for 5 days at 3 road sites and 3 background sites, 2 periods in wet and 2 period in dry season. Traffic data was collected using video camera with respective to SO_2 concentration and wind speed and direction. Collected SO_2 data were compared between the road, background, and 2 reference sites that were secondary data obtained from the Pollution Control Department. Rainwater was also collected using stationary rain gauge and pH, Na^+ , K^+ , Na^+ , NH_4^+ , Cl^- , NO_3^- , NO_x and SO_2 were analyzed and compared.

The study shows significant influence of distant from BTS structure and season on SO_2 concentration. Average SO_2 concentration at the road site is 9.47 ppm. and 5.36 ppm at the background site. The respective concentration in wet and dry season at those sites is 6.68, 12.29, 5.59 and 4.85 ppm. The relationship between traffic volume and SO_2 concentration is also found significant in some areas of road and background sites. However, there is no significant relationship between pH of rain and SO_2 concentration.

Because the SO_2 concentration at all stations exceeded the ambient air quality standard, recommended mitigation measures include installation of automated air quality monitoring sensor and air ventilation system with water spray at these sites to alleviate the problem.

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