

Kittichai Duangmal 2014: Mechanisms of Nano Technology for Spraying Water Droplets to Decrease Traffic Dust Under the Sky-Train Station of Bangkok.
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This research studied on mechanism of nano technology for spraying water droplets to decrease traffic dust under BTS Bangkok Station via advanced image technique in laboratory size 2 x 2 x4 m. The images were taken dust in vertical direction at 3 levels (0.5, 1.5, and 2.5 m.), when water spraying and non water spraying at different time. The images were analyzed for number and size of particles. The research found that the deposit rate of sprayed dust particle size less than 500 μm was higher than non-sprayed particle. The sprayed particle size was increased by time as shown in equation $y = 0.8087e^{0.6013x}$ ($R^2 = 0.9359$). Meanwhile, y = average of particulate, x = time (minute). The appropriated water amount should be 10 times of the dust concentration.

The particle decreasing efficiency under Saphan Khwai Station were tested by spraying water droplets every 10 minutes, 2.0 m-nozzle distance, 4 rows, 100 m-length, total 208 nozzles. Samples were collected every 3 hour (5 am.-8 pm.) at street isle, footpath, outside of station, and under station for determining TSP and PM10 concentrations. The findings were shown that the maximum efficiency of particle decreasing by water spraying for TSP 33.7% and PM10 43.7%, respectively, depended on wind direction, open channel beside the station, and station carriage.

Student's signature

Thesis Advisor's signature