

Particulate pollution levels and source apportionment in six asian cities: Preliminary findings of AIRPET

Oanh N.T.K., Upadhyay N., Zhuang Y.-H., Hao Z., Murthy D.V.S., Swaminathan T., Puji L., Villarin J.T.,
Khervin C., Co H.X., Trung D.N., Lindgren E.S.

Environmental Engineering and Management Program, Asian Institute of Technology, Thailand; Research
Center for Eco-Environmental Sciences, Graduate School, University of Science and Technology of China,
Beijing, China; Department of Chemical Engineering, Indian Institute of Technology, Madras, India;
Department of Environmental Engineering, Institute of Technology of Bandung, Indonesia; Manila
Observatory, Quezon City, Philippines; Faculty of Environmental Sciences, Hanoi University of Science,
Hanoi, Viet Nam; Hogskolan I Boras, Sweden

Abstract: AIRPET, an Asian regional air pollution research network, which is coordinated by the Asian
Institute of Technology, involves six cities: Bandung, Bangkok, Beijing, Chennai, Manila, and Hanoi. One
of the objectives of the network is to provide a comprehensive assessment of particulate matter (PM) air
quality through monitoring and receptor modeling tools jointly by six research teams in these cities. The
results within the scope of this monitoring and modeling objective in phase 1 (2001-2003) were presented.
In total, the network collected over 2500 PM_{2.5} and PM₁₀ samples from characteristic urban sites. In all
these cities the levels of PM₁₀ and PM_{2.5} were found high especially during the dry season which the
frequently exceeded the EPA standard for PM₁₀ and PM_{2.5}, especially at the traffic sites. Traffic had the
highest PM_{2.5} contribution in most cities with the exceptional high share (> 70%) in Manila. Traffic and
coal combustion had high contribution in Beijing while NaNO₃ was found high in Hanoi. This is an abstract
of a paper presented at the 98th AWMA Annual Conference and Exhibition (Minneapolis, MN 6/21-
24/2005).

Author Keywords: Coarse PM; Comparative analysis; Composition; Fine PM; Six Asian Cities; Source
apportionment

Year: 2005

Source title: Proceedings of the Air and Waste Management Association's Annual Conference and
Exhibition, AWMA

Volume: 2005

Page count: 11

Link: [Scopus Link](#)

Correspondence Address: Environmental Engineering and Management Program, Asian Institute of
Technology Thailand

Sponsors: 3M

Conference name: Air and Waste Management Association's - 98th annual Conference and Exhibition

Conference date: 21 June 2005 through 24 June 2005

Conference location: Minneapolis, MN

ISSN: 10526102

Language of Original Document: English

Abbreviated Source Title: Proceedings of the Air and Waste Management Association's Annual Conference and Exhibition, AWMA

Document Type: Conference Paper

Source: Scopus

Authors with affiliations:

- Oanh, N.T.K., Environmental Engineering and Management Program, Asian Institute of Technology, Thailand
- Upadhyay, N., Environmental Engineering and Management Program, Asian Institute of Technology, Thailand
- Zhuang, Y.-H., Research Center for Eco-Environmental Sciences, Graduate School, University of Science and Technology of China, Beijing, China
- Hao, Z., Research Center for Eco-Environmental Sciences, Graduate School, University of Science and Technology of China, Beijing, China
- Murthy, D.V.S., Department of Chemical Engineering, Indian Institute of Technology, Madras, India
- Swaminathan, T., Department of Chemical Engineering, Indian Institute of Technology, Madras, India
- Puji, L., Department of Environmental Engineering, Institute of Technology of Bandung, Indonesia
- Villarin, J.T., Manila Observatory, Quezon City, Philippines
- Khervin, C., Manila Observatory, Quezon City, Philippines
- Co, H.X., Faculty of Environmental Sciences, Hanoi University of Science, Hanoi, Viet Nam
- Trung, D.N., Faculty of Environmental Sciences, Hanoi University of Science, Hanoi, Viet Nam
- Lindgren, E.S., Hogskolan I Boras, Sweden

References:

- Chan, Y.C., Simpson, R.W., McTainsh, G.H., Vowles, P.D., Cohen, D.D., Baile, G.M., (1997) Characterisation of Chemical
- Dockery, D.W., Pope III, C.A., Acute respiratory effects of particulate air pollution (1994) *Annual Review Public Health*, 15, pp. 107-132
- Donaldson, K., Li, X.Y., MacNee, W., Ultrafine (nanometer) particle mediated lung injury (1998) *Journal of Aerosol Science*, 20, pp. 1453-1456
- Ho, K.F., Lee, S.C., Chan, C.K., Yu, J.C., Chow, J.C., Yao, X.H., Characterization of chemical species in PM_{2.5} and PM₁₀ aerosols in Hong Kong (2003) *Atmospheric Environment*, 37, pp. 31-39
- Kim, Y.J., Kim, K.W., Oh, S.J., Seasonal characteristics of haze observed by continuous visibility monitoring in the urban atmosphere of Kwangju, Korea (2001) *Environmental Monitoring and Assessment*, 70, pp. 35-46
- Liu, Y., Peter, H.D., Anthropogenic aerosols: Indirect warming effect from dispersion forcing (2002) *Nature*, 419, pp. 580-581
- Polissar, A.V., Hopke, P., Paatero, P., Malm, W.C., Sisler, J.F., Atmospheric aerosol over Alaska - 2. Elemental composition and sources (1998) *Journal of Geophysical Research*, 103 (D15), pp. 19045-19057
- Preining, O., Aerosol and climate - An overview (1991) *Atmospheric Environment*, 25 A, pp. 2443-2444
- Schwartz, J., Neas, L.M., Fine particles are more strongly associated than coarse particles with acute respiratory health effects in schoolchildren (2000) *Epidemiology*, 11, pp. 6-10
- Sun, Y., Zhuang, G., Wang, Y., Han, L., Guo, J., Dan, M., Zhang, W., Hao, Z., The air-borne particulate pollution in Beijing - Concentration, composition, distribution and sources (2004) *Atmospheric Environment*, 38, pp. 5991-6004