

Studies on difference of chemical constitutes of ambient particles emitted from Xuanwei coal combustion, bottom ashes and raw coal samples by using of ATOFMS

LU SENLIN¹, LIU PIN-WEI¹, CHENG PING¹, LIU MEI¹, ZHANG WEN-CHAO¹, PAN RUIQI¹, WANG QIANG-XIANG¹, YONEMOCHI SHINICHI², WANG QINGYUE³

¹ School of Environmental and Chemical Engineering, Shanghai University □ Shanghai 200444 □ China

² Center for Environmental Science in Saitama, Saitama 374-0115, Japan

³ School of Science and Engineering, Saitama University, Saitama 338-8570, Japan

Xuanwei coal combustion pollutants (mainly as particulate matters) are regarded as a key factor to cause high lung cancer incidence of local residents. However, mechanism of this kind of lung cancer is still not clear. We tried to compare difference of chemical constitutes of ambient particles from Xuanwei coal combustion, bottom ashes and raw coal samples by using of a time-of-flight mass spectrometer (ATOFMS). Our results showed that all measured particles could be divided into 9 types based on mass spectral similarity, carbonaceous particles, rich-Na particles, rich-K particles, rich-Fe particles, rich-Al particles, rich-Ca particles, rich-Si particles, heavy metals containing particles and PAH containing particles. Mass concentration of ambient particles distributed in the size range of 0.56 ~ 1.0 μ m, however, number concentration mainly existed in the size range of less than 0.56 μ m. Most of carbonaceous particles and PAH containing particles were found in the size less than 0.56 μ m, and iron containing particles were 0.56 ~ 1.0 μ m, and heavy metals particles (mainly consisted by Ti, V, Cr, Cu, Zn, and Pb) were less than less than 1 μ m.

In bottom ash particles, number concentration of rich-Na, K particles was dominant in the measured particles, and Al, Ca, Fe, Mg, Mn were the main chemical elements. In raw coal samples, carbonaceous particles were dominant particles. Armed with the above data, oxidative ability and toxicity of the samples will be carried out.

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