

CHARACTERISTICS OF CONGENER DISTRIBUTIONS AND REMOVAL EFFICIENCIES OF PCDD/Fs FROM THREE SOLID WASTE INCINERATORS

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Partitioning of PCDD/F congeners between gaseous and particulate phases and removal efficiencies of the existing air pollution control devices (APCDs) for PCDD/Fs at three solid waste incinerators in Taiwan are evaluated via stack sampling and analysis. Three incinerators (two are municipal waste incinerators and one is industrial waste incinerator) investigated are equipped with activated carbon injection (ACI), selective catalytic reduction system (SCR) and fixed carbon bed (FCB) as major PCDD/F control devices, respectively. The results obtained on gas/particulate partitioning in flue gases indicate that the particulate-phase PCDD/Fs accounted for 27.7%, 24.7% and 20.1% of the total PCDD/F concentrations at the outlets of cyclone (CY), electrostatic precipitator (EP) and wet electrostatic precipitator (W-EP), for I-1, I-2 and I-3, respectively. In addition, the gas/particulate partitioning in flue gas after PCDD/Fs control devices is quite different in three incinerators, that was affected by the removal efficiencies and mechanism with different APCDs. The average PCDD/F concentrations of stack gas are 0.17, 0.043 and 1.74 ng-TEQ/Nm³ in those three incinerators, respectively. The average removal efficiency of PCDD/Fs achieved with ACI (I-1) reaches 95%, SCR system (I-2) reaches 99% and FCB (I-3) reaches 72%. Since ACI and FCB can only transfer the PCDD/Fs from gas-phase to particulate phase and SCR system can effectively destroy PCDD/F congeners in flue gas, SCR system could serve as a better PCDD/F control device for the solid waste incineration. Key words: dioxin, SCR, activated carbon, stack sampling, gas/particle phase.