國立臺北科技大學九十八學年度碩士班招生考試

系所組別：3220 環境工程與管理研究所乙組

第一節　環境科學　試題

注意事項：

1. 本試題共四題，配分共 100 分。
2. 請標明大題、子題編號作答，不必抄題。
3. 全部答案均須在答案卷之答案欄內作答，否則不予計分。

一、 聯合國氣候化綱要公約第三次締約國大會中所通過的〔京都議定書〕，明訂的溫室氣體是指那些氣體?其對溫室效應之高低約略為何(假設其他條件相同下)? (25%)

二、 何謂生態學(Ecology)？另請以碳(Carbon)為例，說明生態系統中物質循環(Cycling of Materials)之原理？(25%)

三、 請簡述下列中文意義與成(原)因：(每小題 5%，計 25%)

1. BOD
2. Dioxins/Furans
3. TSP
4. Ignition Loss
5. LD_{50}

四、 請以中文 100 字內說明下列文章之重點：(25%)

Volatile organic compounds (VOCs) emitted from surface coating have been caused growing public concern for air quality, even low-emitted VOCs from water-based paints for indoor air quality in Taiwan urban areas. On a view of point on engineering application, the paper proposes a mathematical model to simulate the VOCs dynamic emission based on mass transfer and molecular diffusion theories. A series of field-analogous experiments were carried out to continuously measure VOCs emitted from two typical water-based paints using GC-FID monitor in an artificial wind tunnel system in this work. The two paints, which are mainly composed of hydrophilic acrylic resin, are used for indoor decoration and cement wall coating. With these experimental data, a useful semi-empirical correlation was suggested to estimate VOC emission rates for the water-based paints. It was found that the dimensionless emission rate can be correlated with three dimensionless groups, i.e. Biot number, Fourier number and dimensionless air exchange rate, which is valid in appropriate conditions suggested by the work with a statistical deviation of ±7.6%.Thus, with the correlation suggested by this paper, it seems feasible to predict the dynamic emission rates for VOCs during painting process. The correlation would be also applicable to assess hazardous air pollutant (HAP) impact on indoor air quality or for environmental risk assessment.