國立中央大學97學年度碩士班考試入學試題卷

所別：環境工程研究所碩士班 甲組　科目：環境化學及環境微生物學　共 2 頁 第 1 頁

＊請在試卷答案卷（卡）內作答

環境化學

1. 試解釋下列定律：(10%)
   a.波以耳定律(Boyle's Law)
   b.查理定律(Charles'Law)
   c.道爾吞分壓定律(Dalton's Law of Partial Pressure)
   d.勞特定律(Raoult's Law)
   e.黑斯定律(Hess's Law)

2. 何謂 BCF(Bioconcentration factor)與 Kow，這二個常數在預測有機污染物之傳輸行為上有何意義？(10%)

3. 何謂酸度(Acidity)？水體之酸度主要來源為何？水體中之酸度對水質有何重要指標意義？酸度高低與 pH 值的大小有何差異？(10%)

4. 土壤為地殼岩盤風化(或循環)的過渡產物，在風化過程中因官能基的解離、斷裂鍵或同型取代作用常使土壤帶負電而發生陽離子交換現象(cation Exchange)。但是，在某些特定的土壤組成及環境條件下，土壤有可能攜帶正電而對環境中之陰離子污染物產生極高的親和力。請詳細說明在何種條件(或土壤組成)下會使土壤攜帶正電荷並說明土壤對陰離子污染物之各種作用機制。(10%)

5. 某些界面活性劑具有"環境荷爾蒙"特性，當這些界面活性劑被釋放於環境中時，除了對人體健康造成影響外，亦會影響環境中污染物之傳輸行為。請詳細說明存在於環境基質中之界面活性劑如何影響有機污染物之傳輸行為。(10%)

參考用

注意：背面有試題

Environmental microbiology

1. Compare the ATP yield, electron acceptor, and final products of aerobic and anaerobic metabolisms. (18%)

2. What are the possible reasons for sludge bulking in an activated sludge systems (10%)

3. Compare the differences between the compositions of Gram's negative and Gram's positive bacteria. Why knowing whether the bacteria is Gram's positive or negative is important in environmental engineering? (12%)

4. True (correct) or False (wrong) question. (If the statement is correct, write down (T) in the answer sheet; if the statement is wrong, write down (F) in the answer sheet. 2% each)
   (a) The energy is stored in ribosomes.
   (b) *Cryptosporidium* is a spore-forming bacteria.
   (c) Transforming nitrogen into organic nitrogen is called "nitrogen fixation".
   (d) Nitrifying bacteria is heteretrophs.
   (e) The carbon source of methanogen is CH_4.

注意：背面有試題