

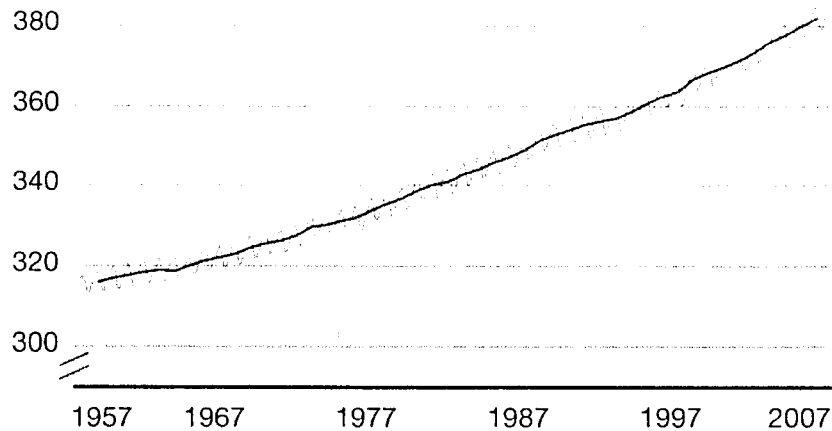
國立中央大學98學年度碩士班考試入學試題卷

所別：大氣物理研究所碩士班 一般生 科目：普通化學 共 1 頁 第 1 頁

*請在試卷答案卷(卡)內作答

1. Following is a plot, showing monthly mean atmospheric CO₂ concentrations observed at Mauna Loa, Hawaii, during the period 1957-2007. The y-axis indicates CO₂ concentrations (in the units of ppm), and the x-axis indicates time.
 - (1) What does this plot say about the CO₂ concentrations in the atmosphere? (10%)
 - (2) Please estimate the growth rate of CO₂ (ppm/year) during this period. (10%)
 - (3) Why do we need to care about CO₂ concentrations in the atmosphere? (10%)

Atmospheric CO₂
concentration (ppm)



2. What is molecular weight (molar mass) (5%)? What are the major constituents for the Earth's atmosphere (5%)? Estimate molecular weight for one mole of the air at stand atmospheric condition (1 atm and 0-degree Celcius). (5%) How do we calculate dry air density? (5%)
3. (1) What is an isotope? (5%)
(2) Write down the isotopes for carbon, hydrogen, and oxygen (15%)
4. Rate equations: Suppose that chemical [A] can be decomposed to produce products:
k: A → products
where k is rate constant (1/s), representing how efficient [A] will be destroyed to produce products.
 - (1) Please write down reaction rate equation for [A]. (10%)
 - (2) If k is a constant with respect to time. Please find an analytic solution of [A] at any moment t given the initial concentrations of [A] is [A]₀. (10%)
 - (3) Plot the solution of [A] with respect to time. (10%)

參考用