國立臺灣大學99學年度碩士班招生考試試題

1. 請問為何氣相層析質譜儀(gas chromatography/mass spectrometer)對園產品香氣化學的研究十分重要？ (10%)

2. 化學上原果膠、高甲氧基果膠、低甲氧基果膠、果膠酸各有何不同？高甲氧基果膠與低甲氧基果膠凝膠時的化學機制有何不同？主要各利用何種分子間作用力成膠？ (15%)

3. 請就下列園產品中常見的維生素，說明其化學極性(polarity)高低、熱安定性、光安定性、主要的生理作用 (total 20 %)
   (1) Niacin
   (2) Retinol
   (3) Ergosterol
   (4) Tocopherol
   (5) Riboflavin

4. 某乳鐵蛋白(lactoferrin)的等電點 pI = 8.2,
   (1) 當溶液之 pH 為 7.0 時，此乳鐵蛋白帶何種電荷？此時可以被 carboxymethyl 或是 diethylaminoethyl 之樹脂吸附？
   (2) 為何乳鐵蛋白經過酒精沈澱之後，難以回溶？
   (3) 哪些方法可分析此乳鐵蛋白的分子量？(Total 15%)

5. 請舉例解釋以下糖類化學之反應: (Total 15%)
(1) beta-1,4->glucosylation
(2) aldose-ketose rearrangement
(3) amylose hydrolysis using beta-amylase

6. 閱讀測驗，請敘述以下這段文字之意義: (Total 25%)

This paper is a comprehensive review of the effects of bioactive polyphenolic compounds commonly found in many fruits and vegetables on cancer. These include the pheniolic acids, anthocyanins, catechins, stilbenes and several other flavonoids. We have attempted to compile information from most of the major studies in this area into one source. The review encompasses the occurrence and bioavailability of the polyphenolics, the in vitro and in vivo evidence for their effects on cancer, both positive and negative, and the various mechanisms by which the chemicals may exert their effects. Although most of the work done to date indicates a chemopreventative activity of these compounds, there are some studies that show cancer-inducing or no effects. There are several common mechanisms by which these chemicals exert their effects that could be conducive to additive, synergistic, or antagonistic interactions. These include effects on cellular differentiation, proliferation, and apoptosis, effects on proteins and enzymes that are involved in these processes at a molecular level, and other various effects through altered immune function and chemical metabolism.