

## Chem 231 Quiz Number 1

Name \_\_\_\_\_

### A. Short Answer/Multiple Choice Section (2 points each)

1. Besides, placing a solid in a container, adding solvent and shaking, list one other piece of equipment frequently used for extracting analytes from solids with solvents.

Piece of equipment = \_\_\_\_\_

2. Which type of solid phase extraction cartridge would make the most sense for retaining ethanol (a polar organic compound) in a gasoline (mostly non-polar alkyl and aromatic hydrocarbons) sample.

- a) normal phase (or hydrophilic interaction)    b) reversed phase  
c) cation-exchange    d) anion-exchange

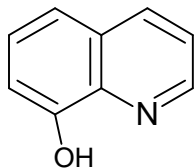
3. List one practical advantage in using thin layer chromatography over HPLC.

4. For which of the following methods is it most important to use an internal standard

- a) HPLC with manual injection    b) HPLC with autosampler injection  
c) GC with manual injection    d) GC with autosampler injection

### B. Calculations/Longer Answer. (5 points each)

1. 8-hydroxyquinoline (see structure below) has an acid group (OH) with a  $pK_a$  of 9.81 and a base group (N:) whose conjugate acid ( $NH^+$ ) has a  $pK_a$  of 4.91. It also has a  $K_{ow}$  of around 100. What would be a useful pH to extract 8-hydroxyquinoline from “permanent ionic compounds” (ions at all pH values) in water using a liquid–liquid extraction with octanol?



2. A chemist is analyzing water for pesticides and has collected 1.0 L water samples. The pesticides are only weakly polar and are extracted from water by solid phase extraction (SPE). Initially, she passes 25 mL of water through a SPE cartridge and elutes the pesticides using 5 mL of methanol which analyzed by direct injection (1  $\mu$ L volume) into a GC. Peaks for pesticides are observed but have low signal to noise ratios.

- a) Describe a change in the procedure which would be expected to increase the signal to noise ratio of the pesticide peaks.  
b) What test should be done to ensure there are no other problems associated with the change in procedure from your answer in a).