

Cumulative Exam
7 April 2005
Electroanalytical Chemistry

Answer all questions with complete sentences and paragraphs. Include diagrams only where appropriate.

1. Why is Ion Chromatography a reasonable topic for a cumulative exam on electroanalytical methods? Describe what differentiates Ion Chromatography over traditional Ion Exchange Chromatography? (15 pts.)
2. What information can be obtained in a cyclic voltammetry experiment? How is such an experiment performed? Please describe the equipment and general procedures. (15 pts.)
3. Draw a diagram of an ion-selective field-effect transistor (ISFET). Explain how it operates. (15 pts.)
4. What information does the scanning electrochemical microscope provide? What are the similarities and differences of scanning electrochemical microscopy with AFM and STM? (15 pts.)
5. Describe how the pH electrode generates a signal that is related to $[H^+]$. Include a diagram in your answer. (15 pts.)
6. How is analyte measured in a CE-EC experiment? What are the key challenges in performing CE-EC? (15 pts.)
7. Open Response: Describe a featured A-page article from analytical chemistry from October 2004 to March 2005 (inclusive). (10 pts.)