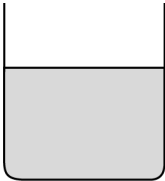


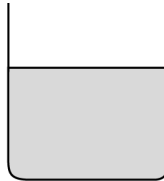
## 2003 AP<sup>®</sup> CHEMISTRY FREE-RESPONSE QUESTIONS (Form B)

6. Answer the following questions about electrochemistry.

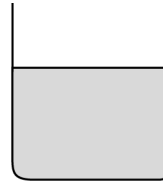
- (a) Several different electrochemical cells can be constructed using the materials shown below. Write the balanced net-ionic equation for the reaction that occurs in the cell that would have the greatest positive value of  $E_{cell}^{\circ}$ .




1.0 M  $\text{Al}(\text{NO}_3)_3$




1.0 M  $\text{Cu}(\text{NO}_3)_2$




1.0 M  $\text{Fe}(\text{NO}_3)_2$



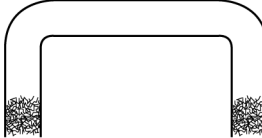
Al Metal Strip



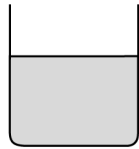
Cu Metal Strip



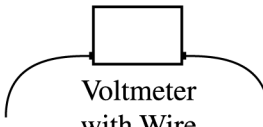
Fe Metal Strip



Materials for Salt Bridge



Solution to Fill Salt Bridge



Voltmeter with Wire

- (b) Calculate the standard cell potential,  $E_{cell}^{\circ}$ , for the reaction written in part (a).
- (c) A cell is constructed based on the reaction in part (a) above. Label the metal used for the anode on the cell shown in the figure below.

