4. Molten $AlCl_3$ is electrolyzed with a constant current of 5.00 amperes over a period of 600.0 seconds. Which of the following expressions is equal to the maximum mass of Al(s) that plates out? (1 faraday = 96,500 coulombs)

   a. $\dfrac{(600)(5.00)}{(96,500)(3)(27.0)}$ grams

   b. $\dfrac{(600)(5.00)(3)(27.0)}{(96,500)}$ grams

   c. $\dfrac{(600)(5.00)(27.0)}{(96,500)(3)}$ grams

   d. $\dfrac{(96,500)(3)(27.0)}{(600)(5.00)}$ grams

   (c. circled)

   $600\ sec \times \dfrac{5\ C}{Sec} \times \dfrac{1\ mol\ e^-}{96,500\ C} \times \dfrac{1\ mol\ Al}{3\ mol\ e^-} \times \dfrac{27\ g\ Al}{1\ mol\ Al}$

5. A chemist wants to plate out 1.00 g of solid iron from a solution containing aqueous Fe^{2+} ions. Which of the following expressions will equal the amount of time, in seconds, it takes if a current of 4.00 A is applied?

   a. e. $\dfrac{(2)(55.85)(4.00)}{(96,500)}$ seconds

   b. f. $\dfrac{(2)(96,500)}{(55.85)(4.00)}$ seconds

   c. g. $\dfrac{(55.85)(96,500)}{(2)(4.00)}$ seconds

   d. h. $\dfrac{(2)(55.85)(96,500)}{(4.00)}$ seconds

   (b. circled)

   $1\ g\ Fe \times \dfrac{1\ mol\ Fe}{55.85\ g\ Fe} \times \dfrac{2\ mol\ e^-}{1\ mol\ Fe} \times \dfrac{96,500\ C}{1\ mol\ e^-} \times \dfrac{1\ Sec}{4\ C}$

6. If 0.060 faraday is passed through an electrolytic cell containing a solution of In^{3+} ions, the maximum number of moles of In (solid) that could be deposited at the cathode is

   (A) 0.010 mole

   (B) 0.020 mole

   (C) 0.030 mole

   (D) 0.060 mole

   (E) 0.18 mole

   (B circled)

   $0.060\ F \Rightarrow 0.060\ mol\ e^- \times \dfrac{1\ mol\ In}{3\ mol\ e^-} = 0.020$

7. If a copper sample containing some zinc impurity is to be purified by electrolysis, the anode and the cathode must be which of the following?

	Anode	Cathode
(A)	Pure copper	Pure zinc
(B)	Pure zinc	Pure copper
(C)	Pure copper	Impure copper sample
(D)	Impure copper sample	Pure copper
(E)	Impure copper sample	Pure zinc

   (E circled)