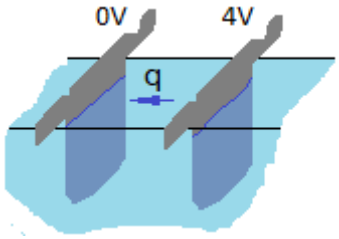
Physics II

Electric Current

Electric current: $I = \frac{\text{charge}}{\text{time}}$

Problem 1.- In electrolytic refining, current passes through a solution to accumulate a pure metal on one of the electrodes. Calculate how much time you would need to accumulate 1 mole of Zn (65.4 grams) with a current of 10.5 A.
Take into account that Zn ions have a charge of +2e or $+3.2\times10^{-19}$ C



Problem 2.- Some people think that water, separated by electrolysis into H_2 and O_2, could be a source of fuel and breathing oxygen for astronauts. Calculate how much current you need to produce 1mol of oxygen (O_2) in one hour.
Charge of one O^{--} ion = -3.2×10^{-19} C, 1 mole of O_2 = 12.05×10^{23} atoms

Problem 3.- A headlamp in a car is rated 55W at 12V, which means that it uses 55 Joules per second and in turn it means that a charge of -4.6C goes through the lamp every second. How many electrons go through the lamp per second?