

Dissolved Oxygen: How much is generated by a O2Tube system?

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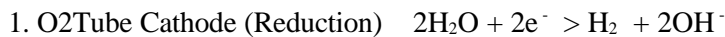
Electrolysis Theory

Faradays Law: The quantity of electricity in coulombs (q) equals the number of equivalents oxidized or reduced (n) times the number of faradays (F). A faraday is 96,490 coulombs or a mole of electrons (6.023×10^{23} electrons. $q = nF$)

Also, the quantity of electrical current in coulombs, q , that passes through a conductor is proportional to both the current, I (amperes), and the length of time it flows. That is amperes (coulombs per second) times seconds gives coulombs, or $q = I (t_2 - t_1)$ where the current is steady and flows uniformly during the interval of time between t_1 and t_2 . Assuming a constant current I , this expression may be combined with Faradays law to give the relationship $q = I (t_2 - t_1) = nF$.

O2Tube Oxygen Production Assuming 100% Efficiency at 2 amps for 1 hour (3600 sec's)

Stoichiometry - The following reactions happen simultaneously:



Oxygen Production - $n = q/F = (2 \text{ amps})(3600 \text{ secs.}) / 96,490 \text{ coulombs/equiv.}$
 $n = 7200 \text{ coulombs} / 96,490 \text{ coulombs/equiv.}$
 $n = 0.75 \text{ equiv.}$

The weight of oxygen oxidized (m) divided by the gram-equivalent weight of oxygen (m_{eq} , 15.9994 g/equivalent from periodic table) is the number of equivalents (n). $n = m / m_{eq}$

$$m = n / m_{eq} = 0.75 \text{ equiv.} / 15.9994 \text{ g/equiv.}$$

$$m = 1.2 \text{ grams of oxygen (O)}$$

or

$$m = 0.6 \text{ grams of stable oxygen (O}_2\text{)}$$

The O2Tube 3 inch cell can be set to operate anywhere between 0.5 and 4.0 amps, therefore, the O2Tube 3 inch cell can be set to produce between 0.15 to 1.2 grams of O₂ per hour.

