**Appendix 1**

The diffusion equation in the case of constant generation rate in the volume is:

The Laplace transform of the diffusion equation in the case of constant generation rate in the volume is given by:



We rewrite the equation as follows:



The solution to this equation is:



Or



Assuming that the only source for P is via the enzyme-substrate interaction in the volume the boundary condition, near the tissue/electrolyte interface (x=L) is:



The second condition is that the electrochemical reaction rate at the surface is fast enough to consume all the arriving molecules, hence we assume that their concentration at x=0 is about 0:



This boundary condition yields:



The second boundary condition gives:



And the solution in the Laplace domain is

The current density, in case of diffusion limited situation:



For very large L, which is estimated as L>>(Dp\*tmeasurement)1/2  we can take a simple approximation:



and the current as a function of time is given as:



For smaller L we can assume the following series approximation:



where Bn is a Bernoulli number. Substituting this expression in the expression for the current:

Calculating the invers Laplace transform we get:

Where U(t) is a step function:

U(t)=0 for t<0 and U(t)=1 for t>0