Unless otherwise noted, assume below that:

T=25°C

R= 1.99 cal mol^-1 deg^-1

Faraday’s Constant= 23,062 cal volt^-1 equiv ^-1

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Question:

Calculate the pH gradient across the inner mitochondrial membrane that is necessary to drive the ATPase reaction in the direction of ATP synthesis under steady state conditions at 25°C where

ATP=10^-5 M

ADP= 10^-3 M

Pi=2 x 10^-2 M

Also- do not ignore the effect of the membrane potential!