Supplemental Material for "A Multifactor Statistical Analysis of the H₂O₂–

Enhanced Photodegradation of Nicotine and Phosphamidon"

Equations S1-S4 were used to calculate the value of the equilibrium constant at different

ionic strengths from the infinite dilution equilibrium constant.

$$K_{a1} = \frac{\{H^+\} \cdot \{HN^+\}}{\{H_2N^{2+}\}} = \frac{\gamma_{H^+} \cdot [H^+] \cdot \gamma_{HN^+} \cdot [HN^+]}{\gamma_{H_2N^{2+}} \cdot [H_2N^{2+}]} \qquad (S1)$$

$$^c K_{a1} = K_{a1} \cdot \frac{\gamma_{H_2N^{2+}}}{\gamma_{H^+} \cdot \gamma_{HN^+}} \qquad (S2)$$

$$K_{a2} = \frac{\{H^+\} \cdot \{N\}}{\{HN^+\}} = \frac{\gamma_{H^+} \cdot [H^+] \cdot \gamma_N \cdot [N]}{\gamma_{HN^+} \cdot [HN^+]} \qquad (S3)$$

$$^c K_{a2} = K_{a2} \left(\frac{\gamma_{HN^+}}{\gamma_{H^+} \cdot \gamma_N} \right) \qquad (S4)$$
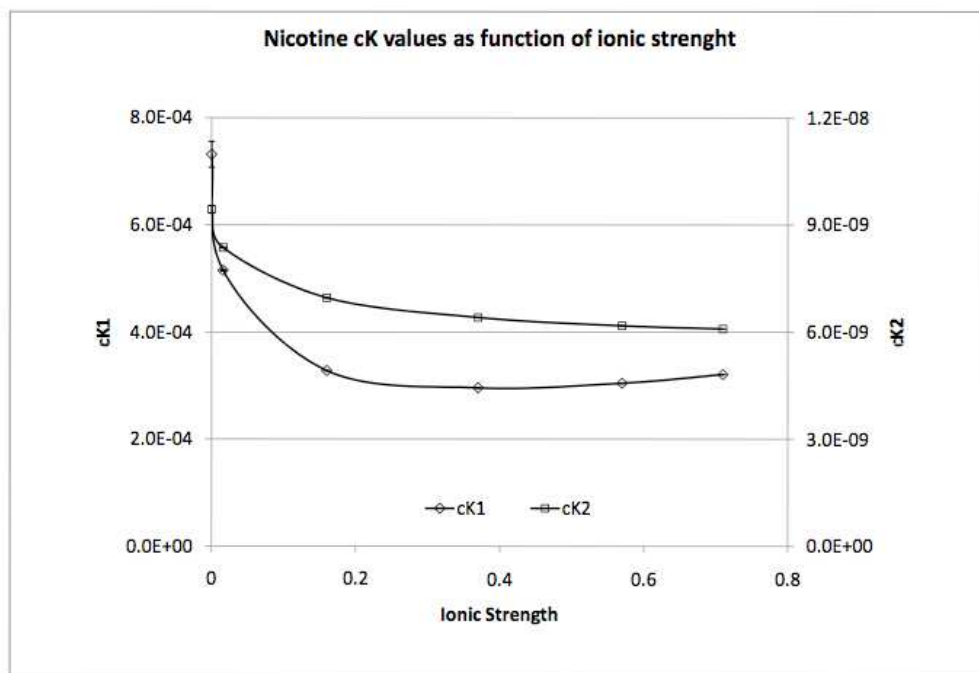
Fig. S1: The magnitudes of the nicotine acidity constants, $^{C}K_1$ and $^{C}K_2$, decrease as the ionic strength approaches 0.2 M, and then level off.
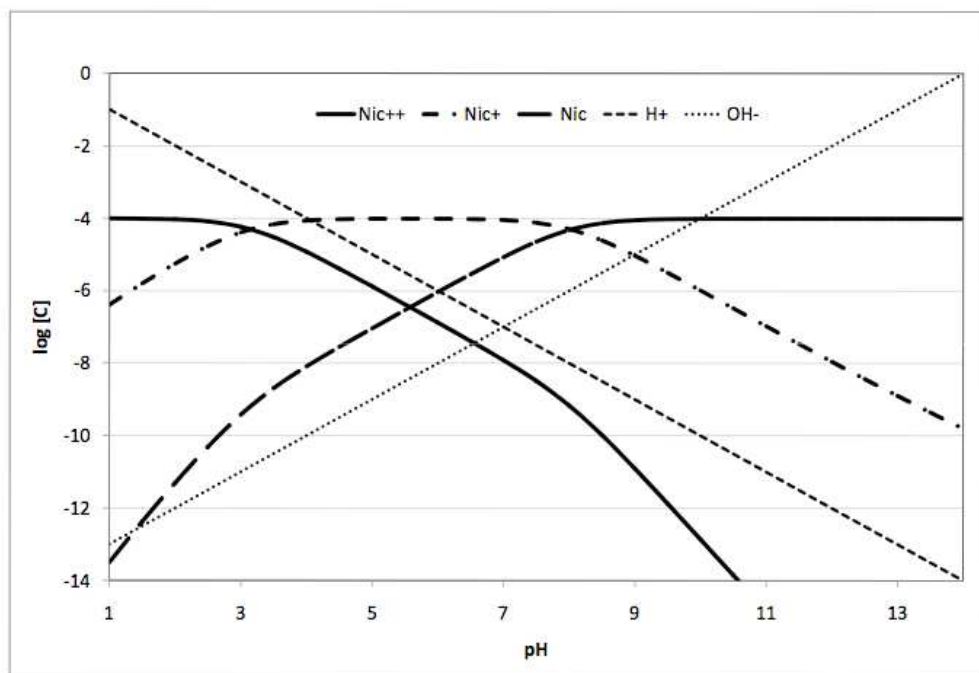
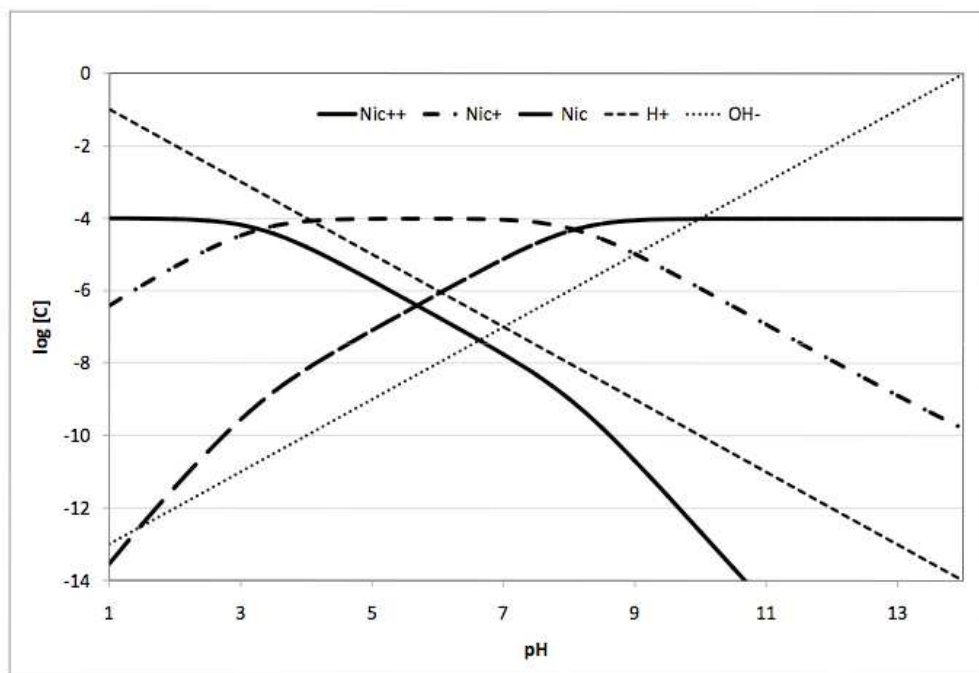Fig. S2: Log c vs. pH plot at $I_c = 0$ M for aqueous nicotine.

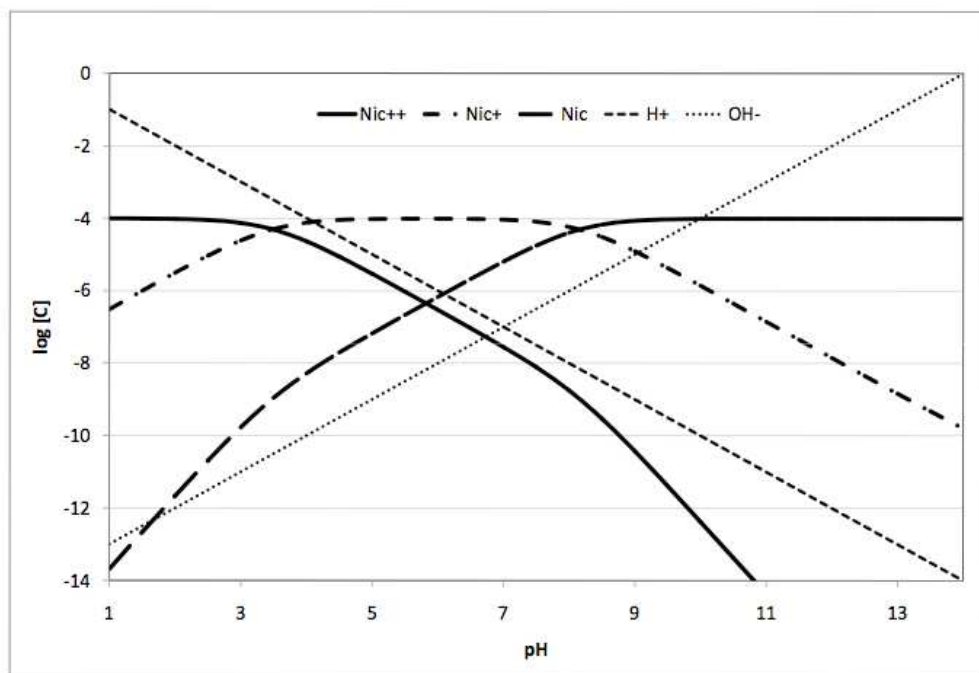Fig. S3: Log c vs. pH plot at $I_c = 0.016$ M for aqueous nicotine.

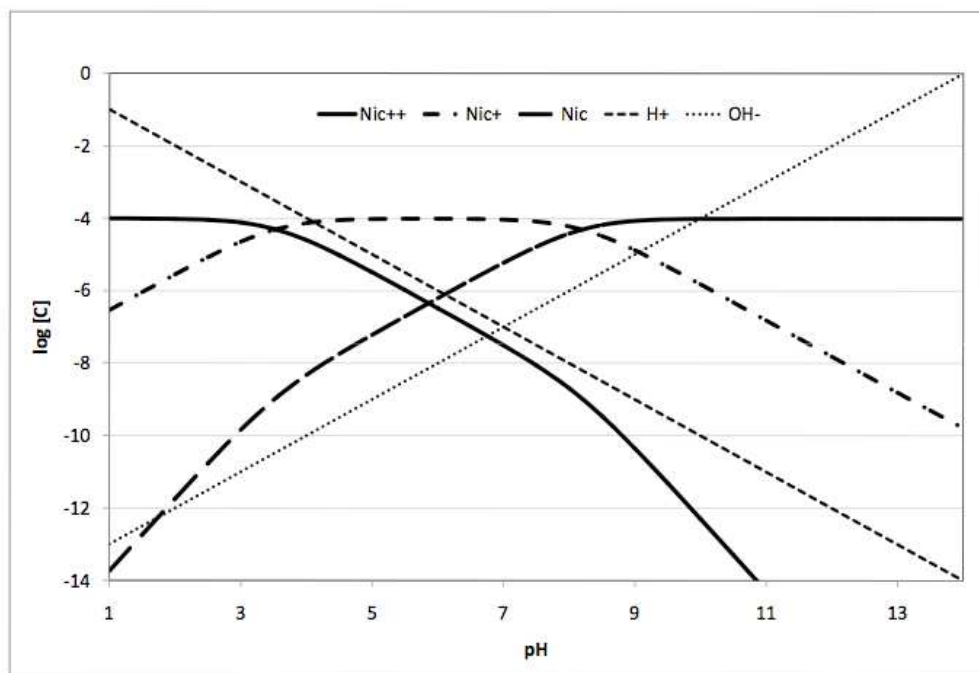Fig. S4: Log c vs. pH plot at $I_c = 0.16$ M for aqueous nicotine.

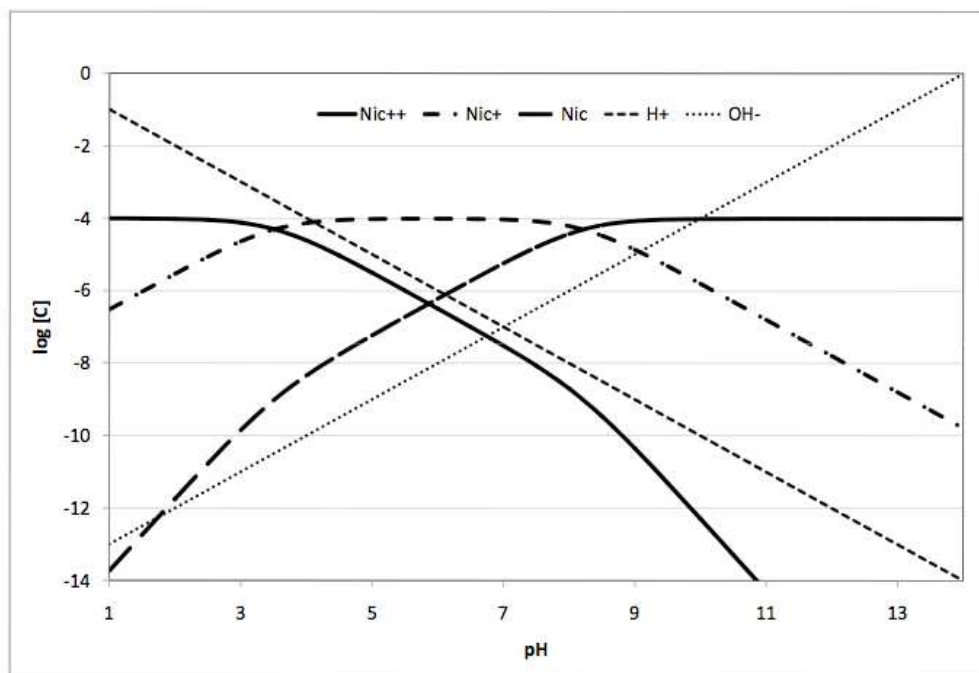Fig. S5: Log c vs. pH plot at $I_c = 0.37$ M for aqueous nicotine.

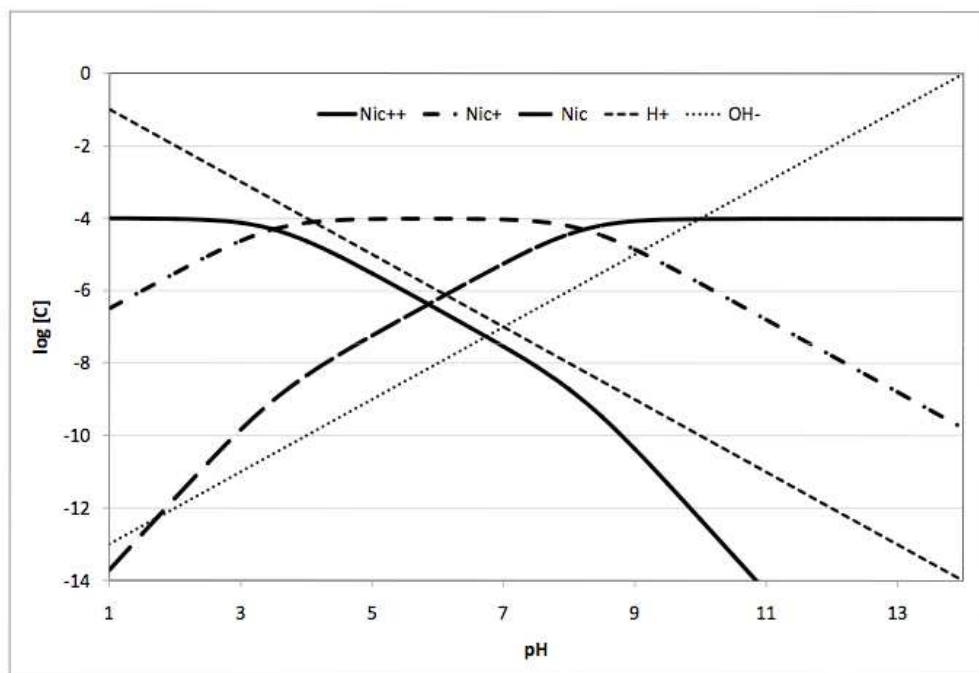Fig. S6: Log c vs. pH plot at I_c = 0.56 M for aqueous nicotine.

Fig. S7: Log c vs. pH plot at $I_c = 0.71$ M for aqueous nicotine.