Chemistry 2740 Spring 2022 Assignment 3

Due: Friday, May 6 at noon

> **Assignments submitted after that time will not be accepted unless there are extenuating circumstances.**

Marks: 7

Natzle and Moore have measured the rate constant for the recombination of H^+ and OH^- in pure water as a function of temperature.[1] They found $E_a = 14.6\,\mathrm{kJ\,mol^{-1}}$ and $A = 3.94 \times 10^{13}\,\mathrm{L\,mol^{-1}s^{-1}}$. Calculate the rate constant for this reaction at 37 °C in a solution with an ionic strength of $0.01\,\mathrm{mol\,L^{-1}}$. The relative permittivity of water at 37 °C is 74.22.

[1] W. C. Natzle and C. B. Moore, *J. Phys. Chem.* **89**, 2605 (1985)