1. (2) The solubility of $O_2(g)$ in water at 25˚C and $P = P^*$ is 0.00126 m$^\circ$.
   (a) Give a balanced chemical equation descriptive of the process of concern here.
   
   (b) Give an expression (including all required numerical entries) with which you could calculate $\Delta G^\circ_f$ for $O_2$ in water at 25˚ (on the molality scale).

2. (2) $\Delta S^\circ_f,298$ has been determined to be −120.51 J mol$^{-1}$ K$^{-1}$ for HCl($aq$). Obtain an equation with which you could calculate $S^\circ_298$ for Cl$^-$($aq$) from this information and tabulated values for the standard molar entropies of H$_2(g)$ and Cl$_2(g)$.

[For answers, see Problems 10.38 and 10.40 in Levine, and today’s lecture notes.]