Marks 6

- All forms of life depend on iron and the concentration of iron in the oceans and elsewhere is one of the primary factors limiting the growth rates of the most basic life forms. One reason for the low availability of iron(III) is the insolubility of the hydroxide, $Fe(OH)_3$, which has a K_{sp} of only 2×10^{-39}.

  Calculate the maximum possible concentration of $Fe^{3+}(aq)$ in the pre-industrial era ocean which had a pH of about 8.2.

$[Fe^{3+}(aq)] =$

How many $Fe^{3+}(aq)$ ions are present in a litre of seawater at this pH?

Answer:

The pH of the ocean is predicted to drop to 7.8 by the end of this century as the concentration of CO_2 in the atmosphere increases. What percentage change in the concentration of $Fe^{3+}(aq)$ will result from this fall in pH?

Answer: