Exercise 11.3
Oxoacids

1. Nitric acid is a strong acid. Nitrous acid is a weak acid.

(a) Give the chemical formula for each of these acids.

i. nitric acid ii. nitrous acid

(b) Draw a Lewis diagram for each of these acids.

i. nitric acid ii. nitrous acid

(c) Redraw each acid to show the molecular geometry. Label bond angles

i. nitric acid ii. nitrous acid

(d) Calculate the approximate pK_a value of each of these acids.

i. nitric acid ii. nitrous acid

(e) How do the calculated pK_a values confirm the original statement? ("Nitric acid is a strong acid. Nitrous acid is a weak acid.")

(f) How does the oxidation state of the central atom of an oxoacid relate to its strength (compared to other oxoacids with the same central atom)?

Use nitric acid and nitrous acid as examples.