

### Answer to Question #58554, Chemistry / Other

Quinine is a weak base that is used to flavour tonic water and treat malaria. The  $K_b$  for quinine is  $3.3 \times 10^{-6}$ . Calculate the pH of a  $1.7 \times 10^{-2}$  mol/L solution of quinine.

**Solution:**

$[OH^-] = x$

$$K_b = \frac{[HB^+][OH^-]}{[B]} = \frac{x^2}{c - x}$$

Since  $x \ll c$

$$K_b = \frac{x^2}{c}$$
$$x = \sqrt{K_b c} = \sqrt{3.3 \times 10^{-6} \times 1.7 \times 10^{-2}} = \sqrt{5.61 \times 10^{-8}} = 2.37 \times 10^{-4}$$
$$pOH = -\log[OH^-] = 3.63$$
$$pH = 14 - pOH = 14 - 3.63 = 10.37$$

**Answer:**

10.37