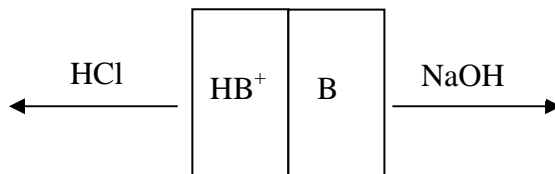


- A buffer system with a weak base B and its conjugate acid  $\text{HB}^+$  is shown in the diagram below with equal concentrations. Complete the diagram by showing the relative concentrations after the addition of some HCl or NaOH.



Write down the balanced net ionic equations for both these reactions.

Calculate the pH of a buffer if it contains 0.200 mol of  $\text{NaNO}_2$  and 0.300 mol of  $\text{HNO}_2$  in 1.00 L of water. The  $\text{p}K_a$  of  $\text{HNO}_2$  is 3.15.

pH =

What is the pH if (a) 0.05 mol of  $\text{HCl}(\text{g})$  and (b) 0.25 mol of  $\text{HCl}(\text{g})$  is added?

(a) pH =

(b) pH =