hydrogen by $(\overset{+}{H})$ and of ionized hydroxyl by $(\overset{-}{OH})$: —

$$\text{If} \qquad (\overset{+}{H}) = 0.0000001N = (\overset{-}{OH})$$

the solution is neutral;

$$\text{if} \qquad (\overset{+}{H}) > 0.0000001N > (\overset{-}{OH})$$

the solution is acid;

$$\text{if} \qquad (\overset{+}{H}) < 0.0000001N < (\overset{-}{OH})$$

the solution is alkaline.

It remains to point out that implicit in these definitions is the well-founded hypothesis that in water the concentrations of hydrogen and hydroxyl ions vary inversely, so that with constant temperature under all circumstances their product is constant:[1] —

$$(\overset{+}{H}) \times (\overset{-}{OH}) = K$$

Substituting in this equation the value 0.0000001 of the concentrations at neutrality, we obtain the value

$$K = 0.00000000000001$$

$$\text{whence} \qquad (\overset{+}{H}) = \frac{0.00000000000001}{(\overset{-}{OH})}$$

[1] This corresponds with the requirements of the Mass. Law.