

Sample Problem 4.1

If 0.36 gram of HCl is added to 0.1 liters of water and if all of the HCl comes apart to release H^+ , what will the pH be?

Answer

mol. wt. HCl = (1 grams/mole H + 35 gram/mole Cl) = 36 grams per mole

To find the number of moles in 0.36 grams HCl, divide the amount (0.36 grams) by the molecular weight.

0.36 grams HCl / 36 grams per mole = 0.01 moles HCl

To find the concentration, divide the number of moles by the volume (in liters).

0.01 moles HCl / 0.1 liters = 0.1 moles per liter, or 0.1 M.

Assume HCl completely dissociates, so there is 0.1 M H^+ ions in solution.

The pH for a 0.1 M solution of HCl is 1. (See Table 4.3.)

4.5 SUMMARY

Here are the main points to remember from this chapter:

- Acid-base reactions produce salts.
- An Arrhenius acid releases a **hydrogen ion** and an Arrhenius base releases a **hydroxide ion**.
- Monoprotic acids release a single proton.
- Polyprotic acids release more than one proton.