

## Answer on Question#72735 – Chemistry – General chemistry

### Question:

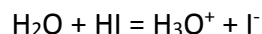
Consider a solution that is made by dissolving 5.2g of hydrogen iodide in 2.0L of pure water at 24 degrees celsius.

- A. what is the hydronium ion concentration of this solution?
- B. what is the pH of this solution?
- C. what is the hydroxide ion concentration of this solution?
- D. what is the pOH of this solution?

### Solution:

$$n(HI) = \frac{m(HI)}{M(HI)} = \frac{5.2 \text{ g}}{127.9 \frac{\text{g}}{\text{mol}}} = 0.0407 \text{ mol}$$

$$C_M(HI) = \frac{n(HI)}{V(\text{solution})} = \frac{0.0407 \text{ mol}}{2 \text{ L}} = 0.020 \text{ M} = 2.0 \times 10^{-2} \text{ M}$$



- A. HI is a very strong acid, therefore  $[\text{H}_3\text{O}^+] = C_M(\text{HI}) = 2.0 \times 10^{-2} \text{ M}$
- B.  $\text{pH} = -\lg[\text{H}_3\text{O}^+] = 2$
- D.  $\text{pOH} = \text{pK}_w - \text{pH} = 14 - 2 = 12$
- C.  $[\text{OH}^-] = 10^{-\text{pOH}} = 10^{-12} \text{ M}$

### Answer:

- A.  $C_M(\text{HI}) = 2.0 \times 10^{-2} \text{ M}$
- B.  $\text{pH} = 2$
- C.  $[\text{OH}^-] = 10^{-12}$
- D.  $\text{pOH} = 12$