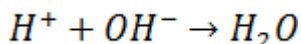
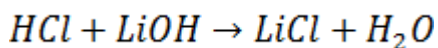


### Answer on Question #67919, Chemistry / General Chemistry

30.00mL of 2.424 M HCl is reacted with an unknown concentration of LiOH three times. The volume of LiOH used is 15.32mL, 15.28mL, and 15.29mL, respectively. What is the concentration of LiOH? How many mols of  $H_3O^+$  were in the solution? How many mols of  $OH^-$  reacted? What is the concentration of  $OH^-$ ?

#### Solution:



$$c(HCl) \times V(HCl) = c(LiOH) \times V(LiOH)$$

$$c(LiOH) = \frac{c(HCl) \times V(HCl)}{V(LiOH)}$$

$$c_1(LiOH) = \frac{c(HCl) \times V(HCl)}{V_1(LiOH)} = \frac{30.00 \times 2.424}{15.32} = 4.7467 (M)$$

$$c_2(LiOH) = \frac{c(HCl) \times V(HCl)}{V_2(LiOH)} = \frac{30.00 \times 2.424}{15.28} = 4.7592(M)$$

$$c_3(LiOH) = \frac{c(HCl) \times V(HCl)}{V_3(LiOH)} = \frac{30.00 \times 2.424}{15.29} = 4.7561(M)$$

$$\bar{c}(LiOH) = \frac{4.7467 + 4.7592 + 4.7561}{3} = 4.7540 (M)$$

$$n(H_3O^+) = n(HCl) = \frac{30.00 \times 2.424}{1000} = 0.0727 (mol)$$

$$n(OH^-) = n(H_3O^+) = 0.0727 mol$$

$$\bar{c}(LiOH) = c(OH^-) = 4.7540 M$$

**Answer:**  $c(LiOH) = 4.7540 M$ ;  $c(OH^-) = 4.7540 M$ ;  $n(H_3O^+) = n(OH^-) = 0.0727 mol$