

How to calculate the equivalent mass of Barium hydroxide octahydrate?

**Solution:**

1.  $Ba(OH)_2 \times 8H_2O$  is a crystalline hydrate. It is the formula to calculate the equivalent mass of crystalline hydrate:

$$M_{e(\text{substance} \times nH_2O)} = M_{e(\text{substance})} + M_{e(H_2O)} \times n;$$

$$M_{e(Ba(OH)_2 \times nH_2O)} = M_{e(Ba(OH)_2)} + M_{e(H_2O)} \times n;$$

2.  $Ba(OH)_2$  is a hydroxide. It is the formula to calculate the equivalent mass of hydroxide:

$$M_{e(\text{hydroxide})} = \frac{M(\text{hydroxide})}{\text{acidity}};$$

$$M(Ba(OH)_2) = 171 \text{ g/mol};$$

$$M_{e(Ba(OH)_2)} = \frac{171}{2} = 85,5 \text{ g/mol};$$

3.  $H_2O$  is an oxide. It is the formula to calculate the equivalent mass of oxide.

$$M_{e(\text{oxide})} = \frac{M(\text{oxide})}{n \times \text{valence}}; n - \text{is a number of atoms of the oxide-forming element in the oxide molecule:}$$

$$M(H_2O) = 18 \text{ g/mol};$$

$$M_{e(H_2O)} = \frac{18}{2 \times 1} = 9 \text{ g/mol}.$$

4. I am calculating the equivalent mass of  $Ba(OH)_2 \times 8H_2O$ :

$$M_{e(Ba(OH)_2 \times 8H_2O)} = 85,5 + 8 \times 9 = 157,5 \text{ g/mol}.$$

**Answer:** the equivalent mass of  $Ba(OH)_2 \times 8H_2O$  is 157,5 g/mol.