Simulator

Previous Years AIEEE/JEE Mains Questions

1. 29.5 mg of an organic compound containing nitrogen was digested according to Kjeldahl's method and the evolved ammonia was absorbed in 20 mL of 0.1 M HCl solution. The excess of the acid required 15 mL of 0.1 M NaOH solution for complete neutralization. The percentage of nitrogen in the compound is :- **[AIEEE-2010]**

(1) 29.5 (2) 59.0 (3) 47.4 (4) 23.7

2. The recommended concentration of fluoride ion in drinking water is up to 1 ppm as fluoride ion is required to make teeth enamel harder by converting $[3Ca_3(PO_4)_2 \cdot Ca(OH)_2]$ to : **[JEE-Mains -2018]**

(1) $[3(CaF_2) \cdot Ca(OH)_2]$ (2) $[3(Ca_3(PO_4)_2 \cdot CaF_2]$

(3) $[3(Ca(OH)_2] \cdot CaF_2]$ (4) $[CaF_2]$

1	2
4	2

Solutions

1. Equation of NH_3

$= (0.1 \times 20) - (0.1 \times 15) = 0.5$

wt. of NH_3

$= 0.5 \times 17 = 8.5$ mg

wt. of 'N'

$= \frac{14}{17} \times 8.5$ mg $= 7$ mg

$\%$ of 'N' $= \frac{7}{29.5} \times 100 = 23.7$

2. $[3Ca_3(PO_4)_2.Ca(OH)_2] + 2F^{\ominus} \longrightarrow$

(drinking water upto 1ppm)

$[3Ca_3(PO_4)_2.CaF_2] + 2OH^{\ominus}$

(Harder teeth enamel)