## 285.

## Problem 27.31 (RHK)

We have to calculate the number of coulombs of positive charge in a glass of water. We may assume that the volume of water in the glass is $250 \mathrm{~cm}^{3}$.

## Solution:

Mass of $250 \mathrm{~cm}^{3}$ of water will be 250 g . Amount of positive charge in each molecule of water, $\mathrm{H}_{2} \mathrm{O}$, is $10 e=10 \times 1.6 \times 10^{-19} \mathrm{C}$, as number of protons in $\mathrm{aH}_{2} \mathrm{O}$ molecule are $2+8$.

The number of $\mathrm{H}_{2} \mathrm{O}$ molecules in 18 g of water are equal to the Avogadro's number, $6.02 \times 10^{23}$. Therefore, the number of $\mathrm{H}_{2} \mathrm{O}$ molecules in 250 g of water will be

$$
N=\frac{6.02 \times 10^{23} \times 250}{18}=8.36 \times 10^{24} .
$$

Therefore, the total positive charge in coulombs in $250 \mathrm{~cm}^{3}$ of water will be

$$
Q=8.36 \times 10^{24} \times 1.6 \times 10^{-18} \mathrm{C}=1.34 \times 10^{7} \mathrm{C}=13.4 \mathrm{MC} .
$$

