

0.099913175 moles of calcium carbonate is the solute in some mass (in grams) of solution coming to a concentration of 22 ppm. What is the mass of solution?

$$m(\text{CaCO}_3) = n(\text{CaCO}_3) \times M(\text{CaCO}_3);$$
$$M(\text{CaCO}_3) = 100,0869 \text{ g/moles};$$
$$m(\text{CaCO}_3) = 0,099913175 \text{ moles} \times 100,08690 \text{ g/moles}$$
$$\approx 10 \text{ g}$$

if 1ppm = $1 \times 10^{-6} \text{ (g/g)}$ - the ratio of the mass of the solute to the mass of the solution.

$$\text{So, } \begin{array}{l} 22 \times 10^{-6} \text{ g solute} \text{ --- } 1 \text{ g solution} \\ 10 \text{ g solute} \text{ --- } X \text{ g solution} \end{array}$$

$$X = \frac{10 \text{ g (solute)} \times 1 \text{ g (solution)}}{22 \cdot 10^{-6} \text{ g (solute)}} =$$
$$= 454545 \text{ g} = m(\text{solution})$$

Answer provided by www.AssignmentExpert.com