Task:

A 999mL \rm NaCl solution is diluted to a volume of 1.29L and a concentration of 2.00\it M . What was the initial concentration?

Solution:

The formula for calculation of concentration is

$C(M) = n(mol) / V(L)$

C – molarity (M)

n – number of moles of substance

V- volume of solution (L)

When the solution is diluted the amount of NaCl (number of moles) remains constant. Only volume of solution changes

$n_1 = C_1 \cdot V_1$
$n_2 = C_2 \cdot V_2$

C_1 – molarity (M) of initial solution

n_1 – number of moles in initial solution
V_1- volume of initial solution (L)

C_2 – molarity (M) of new solution

n_2 - number of moles in new solution

V_2- volume of new solution (L)

$n_1 = n_2$

$C_1 \cdot V_1 = C_2 \cdot V_2$

The initial concentration is
$C_1 = C_2 \cdot V_2 / V_1$
$C_1 = 2.00 \cdot 1.29 / 0.999 = 2.58$ M

Answer: $C_1 = 2.58$ M