For this purpose, I will choose the combination of CaBr2 with a mass of 6g in a total solution volume of 3L.

1. %mass/volume concentration

To calculate the %mass/volume concentration, we will use the following formula:

%mass/volume concentration = (mass of solute / volume of solution) * 100%

%mass/volume concentration = (6g / 3L) * 100% = 2.0%

Therefore, the %mass/volume concentration of the CaBr2 solution is 2.0%.

2. Molarity

To calculate the molarity, we will first need to calculate the number of moles of CaBr2 in the solution. We can do this by using the following formula:

Number of moles = mass of solute / molar mass of solute

The molar mass of CaBr2 is 200.09 g/mol.

Number of moles = 6g / 200.09 g/mol = 0.03 mol

Now that we know the number of moles of CaBr2 in the solution, we can calculate the molarity by using the following formula:

Molarity = number of moles of solute / volume of solution in liters

Molarity = 0.03 mol / 3L = 0.01M

Therefore, the molarity of the CaBr2 solution is 0.01 M.

3. Osmolarity

To calculate the osmolarity, we will need to consider the fact that CaBr2 is an ionic compound and will dissociate into two ions in solution. Therefore, the osmolarity of the solution will be twice the molarity of the CaBr2 solution.

Osmolarity = 2 * molarity

Osmolarity = 2 * 0.01 M = 0.02 Osm

Therefore, the osmolarity of the CaBr2 solution is 0.02 Osm.

Reference

Bauer, R. (2018). Introduction to Chemistry (5th ed.). McGraw-Hill Higher Education (US). https://ambassadored.vitalsource.com/books/9781260162165