Parts per Million

New Regents original practice • Name: _____ Date: _____
Show your work for written answers.

Mass ppm is (mass of solute ÷ mass of solution) × 10^6. Use the same mass units in the numerator and denominator. One kilogram is 1,000,000 milligrams.

1 Which measurement is equivalent to 3 ppm by mass?

(1) 3 mg solute per 1 kg solution

(2) 3 g solute per 1 kg solution

(3) 3 mg solute per 1 g solution

(4) 3 kg solute per 1 kg solution

2 A 2.00 kg solution contains 6.00 mg of a dissolved substance. Calculate its mass concentration in ppm. [1]

Answer and work

3 Which mass belongs in the denominator of the mass-ppm ratio?

(1) Mass of solvent before mixing

(2) Total mass of the solution

(3) Mass of solute

(4) Mass of the empty container

4 A report gives the concentration of a liquid sample in mg/L. Explain what additional quantity is needed to convert exactly to mg/kg for that sample. [1]

Answer and work

Model Screening Records

Use the information below to answer the questions.

A class compares modeled samples containing the same dissolved dye. The recorded solution masses include the dye.

Sample	Dye mass (mg)	Solution mass (kg)
P	2.4	0.80
Q	3.6	0.90
R	4.8	1.60

5 Which sample has the highest dye concentration in ppm?

(1) P

(2) Q

(3) R

(4) All three are equal.

6 Show that P and R have the same mass concentration even though they contain different dye masses. [1]

Answer and work

7 Which sample exceeds a model screening limit of 3.5 ppm?

(1) P

(2) Q

(3) R

(4) P and R

8 A student takes half the mass of well-mixed sample Q. Describe what happens to the mass of dye and the dye concentration in the portion. [1]

Answer and work