

gridlocks – can you unlock the grid?

Mass concentration of solutions

Before you answer the gridlocks below fill in the table of concentrations in g/dm^3 using:

$$\text{mass concentration} = \frac{\text{mass}}{\text{volume (in dm}^3\text{)}} \quad \text{and} \quad \text{mass} = \text{moles} \times \text{molar mass (}M_r\text{)}$$

Substance	M_r	Concentration in mol/dm^3	Concentration in g/dm^3
NaOH	40	0.1	
HCl	36.5		73
$M_2\text{CO}_3$		0.5	53

(M is a metal, you should be able to work out which one)

Gridlock 1

Each row, column and 2 x 2 box contains concentrations of NaOH of 1, 0.5, 0.1 and 0.4 mol/dm^3 . Use your problem solving skills and the skills you used to put answers in the table above to fill in the blank boxes.

concentration in mol/dm^3		concentration in g/dm^3	
0.5			
		16	
		1	
	4		
concentration in g/dm^3		concentration in mol/dm^3	

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Gridlock 2

Each row, column and 2 x 2 box contains information about solutions of NaOH with concentrations of 1, 0.5, 0.1 and 0.4 mol/dm³.

concentration in mol/dm ³		concentration in g/dm ³	
	1		16
			40
0.0125			0.1
moles in 25 cm ³		concentration in mol/dm ³	

Gridlock 3

Each row, column and 2 x 2 box contains information about solutions of NaOH with concentrations of 1, 0.5, 0.1 and 0.4 mol/dm³.

concentration in mol/dm ³		concentration in g/dm ³	
0.5			40
			0.4
0.0025			
moles in 25 cm ³		mass in 25 cm ³ in g	

Mass concentration of solutions – answers

Before you answer the puzzles below fill in the table of concentrations in g/dm^3 using:

$$\text{mass concentration} = \frac{\text{mass}}{\text{volume (in dm}^3\text{)}} \quad \text{and} \quad \text{mass} = \text{moles} \times \text{molar mass (}M_r\text{)}$$

Substance	M_r	Concentration in mol/dm^3	Concentration in g/dm^3
NaOH	40	0.1	4
HCl	36.5	2	73
M_2CO_3	106	0.5	53

(M is sodium)

Puzzle 1 – answers

Each row, column and 2 x 2 box contains concentrations of NaOH of 1, 0.5, 0.1 and 0.4 mol/dm^3 . Use your problem solving skills and the skills you used to put answers in the table above to fill in the blank boxes.

concentration in mol/dm^3		concentration in g/dm^3	
0.5	0.4	4	40
0.1	1	16	20
16	20	1	0.1
40	4	0.5	0.4
concentration in g/dm^3		concentration in mol/dm^3	

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Puzzle 2 – answers

Contains information about solutions of NaOH with concentrations of 1, 0.5, 0.1 and 0.4 mol/dm³.

concentration in mol/dm ³		concentration in g/dm ³	
0.1	1	20	16
0.4	0.5	4	40
0.025	0.0025	0.4	0.5
0.0125	0.01	1	0.1
moles in 25 cm ³		concentration in mol/dm ³	

Puzzle 3 – answers

Contains information about solutions of NaOH with concentrations of 1, 0.5, 0.1 and 0.4 mol/dm³.

concentration in mol/dm ³		concentration in g/dm ³	
0.5	0.1	16	40
0.4	1	20	4
0.025	0.0125	0.1	0.4
0.0025	0.01	1	0.5
moles in 25 cm ³		mass in 25 cm ³ in g	