

# gridlocks – did you unlock the grid?

## Forensic tests 1

Before you answer the puzzle below fill in the table of colours for the flame tests of four metals.

Metal	Colour of flame test	Ion
		Na <sup>+</sup>
	lilac (purple)	K <sup>+</sup>
	brick red	
		Ba <sup>2+</sup>

## Gridlock 1

Each row, column and 2 x 2 box contains information about each of the four metals and their flame tests. Use your problem solving skills and the answers in the table above to fill in the blank boxes.

metal		colour of flame test	
potassium			
		green	
		Na <sup>+</sup>	
	brick red		
	colour of flame test		cation formula

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## Gridlock 2

Before you answer the puzzle below fill in the table of hydroxide precipitates of cations.

Name	Colour of ppt when NaOH(aq) is added	Cation formula	Ppt formed
copper(II)		$\text{Cu}^{2+}$	$\text{Cu}(\text{OH})_2$
iron(II)		$\text{Fe}^{2+}$	$\text{Fe}(\text{OH})_2$
iron(III)			$\text{Fe}(\text{OH})_3$
aluminium		$\text{Al}^{3+}$	

## Gridlock 3

Each row, column and 2 x 2 box contains information about each of the four metals and their hydroxide precipitates Use your problem solving skills and the answers in the table above to fill in the blank boxes.

name		colour of ppt when NaOH(aq) is added	
iron(II)			blue
	$\text{Fe}^{3+}$		$\text{Al}(\text{OH})_3$
formula		ppt formed	

## Forensic tests 1 – answers

Before you answer the puzzle below fill in the table of colours for the flame tests of four metals.

Metal	Colour of flame test	Ion
sodium	orange	Na <sup>+</sup>
potassium	lilac (purple)	K <sup>+</sup>
calcium	brick red	Ca <sup>2+</sup>
barium	green	Ba <sup>2+</sup>

## Puzzle 1 – answers

Each row, column and 2 x 2 box contains information about each of the four metals and their flame tests. Use your problem solving skills and the answers in the table above to fill in the blank boxes.

metal		colour of flame test	
potassium	barium	brick red	orange
calcium	sodium	green	lilac (purple)
green	lilac (purple)	Na <sup>+</sup>	Ca <sup>2+</sup>
orange	brick red	K <sup>+</sup>	Ba <sup>2+</sup>
colour of flame test		ion	

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## Puzzle 2 – answers

Before you answer the puzzle below fill in the table of hydroxide precipitates of cations.

Name	Colour of ppt when NaOH(aq) is added	Cation formula	Ppt formed
copper(II)	blue	$\text{Cu}^{2+}$	$\text{Cu}(\text{OH})_2$
iron(II)	white or pale green	$\text{Fe}^{2+}$	$\text{Fe}(\text{OH})_2$
iron(III)	orange-brown	$\text{Fe}^{3+}$	$\text{Fe}(\text{OH})_3$
aluminium	white	$\text{Al}^{3+}$	$\text{Al}(\text{OH})_3$

## Puzzle 3 – answers

Each row, column and 2 x 2 box contains information about each of the four metals and their hydroxide precipitates Use your problem solving skills and the answers in the table above to fill in the blank boxes.

name		colour of ppt when NaOH(aq) is added	
iron(II)	aluminium	orange-brown	blue
iron(III)	copper(II)	white	white or pale green
$\text{Cu}^{2+}$	$\text{Fe}^{3+}$	$\text{Fe}(\text{OH})_2$	$\text{Al}(\text{OH})_3$
$\text{Al}^{3+}$	$\text{Fe}^{2+}$	$\text{Cu}(\text{OH})_2$	$\text{Fe}(\text{OH})_3$
cation formula		ppt formed	