NEATH PORT TALBOT COLLEGE
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School of Maths & Science
Science Practical

Inorganic plan 1

◆ Aim

Devise and execute a suitable plan to identify four solutions

◆ Introduction

This task tests your knowledge of qualitative inorganic chemistry and your ability to use this information to devise a testing strategy to identify four solutions. You will be provided with the four solutions and their labels which have fallen off. Your task is to reattach the labels to the correct bottle. The first activity you will have to carry out is to device a suitable plan to enable to identify the solutions.

◆ Safety

Control Measures

- The wearing of safety glasses and a laboratory coat at all times will be sufficient to take account of most hazards and significant risks.
- Keep stoppers on bottles as much as is possible.
- Keep flammable liquids away from flames.
- All waste is to be placed in the labelled container immediately after use.
- You are reminded of the need of good laboratory practice in order to maintain a safe working environment.

Hazards

Corrosive You will need to treat all solutions as corrosive

Harmful/ Irritant You will need to treat all solutions as harmful

◆ Procedure

You are provided with four solutions from which the labels have become detached. The four solutions are: sodium hydroxide, magnesium chloride, zinc nitrate and lead nitrate. You are not allowed to use any other reagents other than the solutions themselves. Devise a suitable plan that will allow you to identify each solution. When your plan has been checked you may use it to identify the solutions. In addition you will need to draw up recording documentation for your results before starting the testing.

◆ Questions

1. Explain the nature of any reactions that occurred.

2. Give ionic equations for all the reactions that gave positive outcomes.

◆ **Plan**

Add about 1 cm^3 of a solution to about 1 cm^3 of the remaining three and note if a ppt is formed.

	NaOH	$MgCl_2$	$Zn(NO_3)_2$	$Pb(NO_3)_2$
NaOH		white ppt	white ppt	white ppt
$MgCl_2$			No ppt	white ppt
$Zn(NO_3)_2$				No ppt
$Pb(NO_3)_2$				

NaOH 3 white ppt

$MgCl_2$ 2 white ppt, 1 no ppt

$Zn(NO_3)_2$ 1 white ppt, 2 no ppt

$Pb(NO_3)_2$ 2 white ppt, 1 no ppt

We can now identify the solutions of NaOH and $Zn(NO_3)_2$ from the unique combination of observations: 3 white ppt and 1 white ppt, 2 no ppt respectively.

We now need to distinguish between $MgCl_2$ and $Pb(NO_3)_2$. To do this we will add to 1 cm^3 of test solution NaOH solution dropwise until in excess. $MgCl_2$ will give a white ppt which is insoluble in excess. $Pb(NO_3)_2$ will give a white ppt that is soluble in excess.

◆ **Results Sheet**

	A	B	C	D
A				
B				
C				
D				

Summary of observations (i.e no./colour of/ any ppt):

A:

B:

C:

D:

Inference:

SOLUTION CODE	TEST	OBSERVATION	INFERENCE
	Add NaOH(aq) dropwise to xs		
	Add NaOH(aq) dropwise to xs		