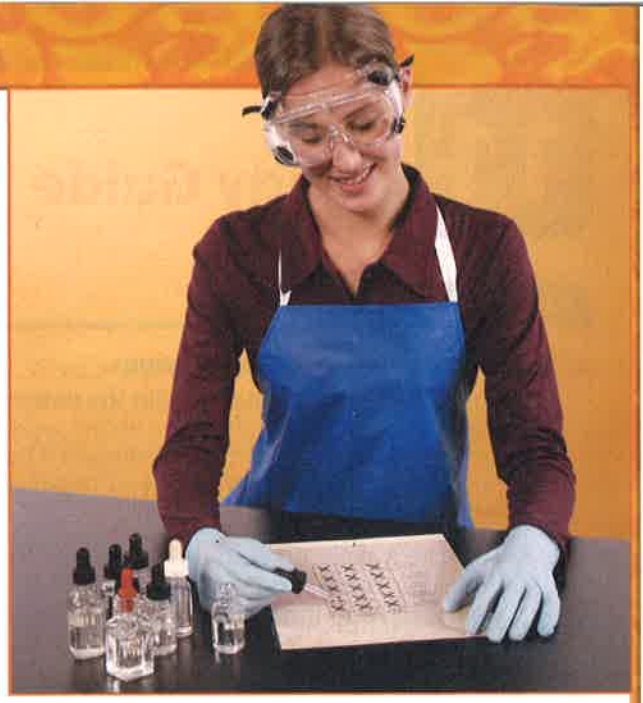
Small-Scale LAB

Precipitation Reactions: Formation of Solids



Purpose

To observe, identify, and write balanced equations for precipitation reactions.

Materials

- pencil
- paper
- ruler
- reaction surface
- chemicals shown in the grid below

	$AgNO_3$ (Ag^+)	$Pb(NO_3)_2$ (Pb^{2+})	$CaCl_2$ (Ca^{2+})
Na_2CO_3 (CO_3^{2-})	a	f	k
Na_3PO_4 (PO_4^{3-})	b	g	l
NaOH (OH^-)	c	h	m
Na_2SO_4 (SO_4^{2-})	d	i	n
NaCl (Cl^-)	e	j	o

Procedure

Copy the grid on two sheets of paper. Make each square 2 cm on each side. Draw large black Xs on one of the grids. Place a reaction surface over the grid with black Xs and add the chemicals as shown. Use the other grid as a data table to record your observations for each solution.

Analyze

Using your experimental data, record your answers to the following in the space below your data table.

1. Translate the following word equations into balanced chemical equations and explain how the equations represent what happens in grid spaces *a* and *g*.
   - **a.** In grid space *a*, sodium carbonate reacts with silver nitrate to produce sodium nitrate and solid silver carbonate.
   - **b.** In grid space *g*, sodium phosphate reacts with lead(II) nitrate to produce sodium nitrate and solid lead(II) phosphate.
2. Write a word equation to represent what happens in grid space *m*.
3. What happens in grid space *d*? Which other mixings gave similar results? Is it necessary to write an equation when no reaction occurs? Explain.
4. Write balanced equations for the other precipitation reactions you observed.
5. Write balanced net ionic equations for the other precipitation reactions you observed.

You're The Chemist

The following small-scale activities allow you to develop your own procedures and analyze the results.

1. **Explain It!** Mix a solution of potassium iodide (KI) with silver nitrate. Then mix potassium iodide solution with lead(II) nitrate. Describe your results. Write balanced equations and net ionic equations for each reaction.
2. **Design It!** Table salt is mostly sodium chloride. Design and carry out an experiment to find out if table salt will form a precipitate with either lead(II) nitrate or silver nitrate. Interpret your results.
3. **Design It!** Design and carry out an experiment to show that iodized table salt contains potassium iodide.