The content on this sheet is assessed on paper 1 only.

Acids and Alkalis part 2

* Indicates that these are some examples only: you could be asked about any substance / reaction.

3.17—CP3—Preparation of copper sulfate crystals

Outline the method to make these crystals, using copper oxide as the base.

Add an excess of copper oxide to some sulfuric acid.

Warm & stir.

Filter off the excess base.

Heat the solution to evaporate some of the water.

Allow water to evaporate.

Explain what happens, in terms of risks, if we heat the solution to dryness.

Solid starts to decrepitate (spit out)

This may cause burns

Suggest & explain two suitable safety measures to take in this practical.

Wear safety glasses to protect your eyes.

Allow hot objects to cool before handling / handle with tongs to prevent burns.

Do not allow the solution to boil dry to avoid the hot solid spitting out.

3.18—Carrying out a titration

Briefly outline how to carry out a titration. Include the names of the appropriate pieces of equipment.

Add the acid to the burette.

Add set volume of alkali to a conical flask using a pipette.

Add indicator.

Add acid until the indicator permanently changes colour.

Repeat until you have two or more similar results.

Repeat with same volumes but no indicator.

3.19—Solubility rules

The rules are all filled in: you need to fill in the exceptions in spaces.

Soluble	Insoluble
All sodium (Na^+) salts	
All potassium (K^+) salts	
All ammonium (NH_4^+) salts	
All nitrate (NO_3^-) salts	
Most chloride (Cl^-) salts	Silver chloride, lead chloride
Most sulfate (SO_4^{2-}) salts	Lead sulfate, barium sulfate, calcium sulfate
Sodium, potassium & ammonium hydroxide & carbonate	**Most** hydroxide (OH^-) and carbonate (CO_3^{2-})

3.20—Predicting precipitates*

Suggest if a precipitate (an insoluble solid) will form in the reaction between the two solutions given. If yes, name the precipitate.

Solutions	Precipitate?	Name
Sodium hydroxide and magnesium sulfate	Yes	Magnesium hydroxide
Calcium nitrate and sodium chloride	No	
Ammonium chloride and silver nitrate	Yes	Silver chloride

3.21—Preparing a pure, dry sample of an insoluble salt*

Briefly outline how to make a sample of calcium carbonate from sodium carbonate solution and calcium chloride solution.

Add solutions together.

Filter and collect the residue (solid).

Rinse with distilled water and leave to dry.