**Student Worksheet**

**Practical 3: Making fertilisers – Ammonium Sulphate**

**Equipment/materials**

* 1M Ammonia
* 1M Sulphuric acid
* Universal indicator paper
* Spotting tiles
* Measuring cylinder
* Tongs
* Bunsen and tripod
* Evaporating dish
* Spatula
* Glass rod
* Heat-proof mat

**Objective**

* Be able to measure mass.
* Be able to calculate masses to use

**Safety**

* Wear eye protection.
* Acids are irritants.
* Ammonia as an irritant.



Harmful



Harmful

**Data**

The following data is for the calculation of the value of *x* only:

H = 1.0, O = 16.0, S = 32.1, N = 14

**Procedure**

1. Add 10cm3 of 1M ammonia to an evaporating dish.
2. Add 10cm3 of 1M sulphuric acid to the solution.
3. Spot out onto universal indicator paper adding 1 drop of ammonia or sulphuric acid until the solution is neutral.
4. Heat until **almost** all of the water has evaporated.
5. Leave to cool.
6. Write the balanced chemical reaction removing the spectator ions

**Questions**

1. Calculate the maximum theoretical mass of ammonium sulphate that could be made.
2. Calculate the % yield of your experiment
3. Calculate the % N in your fertiliser.
4. Calculate the mass of N in your fertiliser
5. Is your actual mass greater or less than the theoretical mass?
6. Explain your answer to (5)

**From the examiner…**

* Consider how many significant figures to use within the calculation.
* Consider how many significant figures to use in your final answer.

**Analysis of results**

* Write a balanced chemical equation for the reaction.
* Calculate the moles of 10cm3 1M sulphuric acid.
* Calculate the moles of 10cm3 1M ammonia.