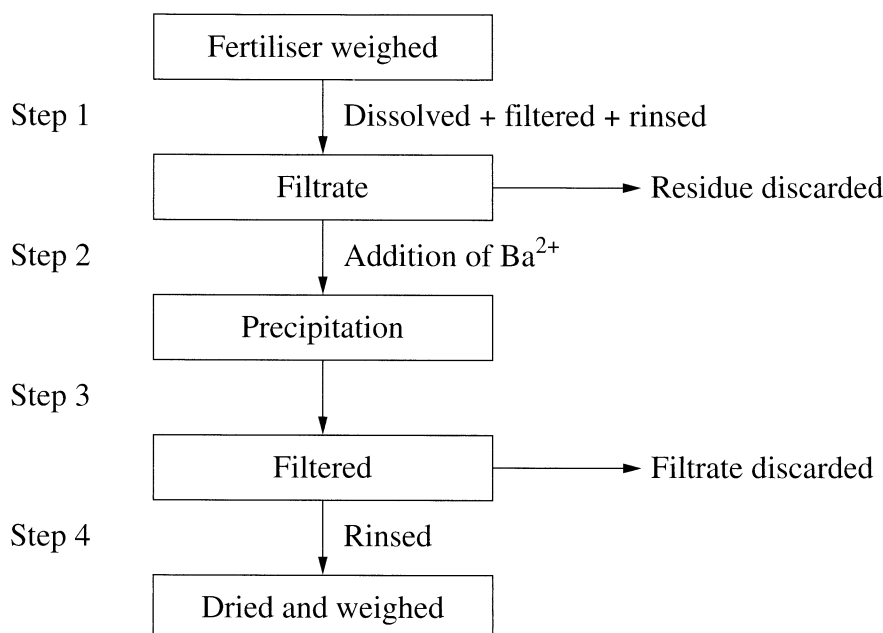


## Question 29 (6 marks)

The flowchart shown outlines the process used to determine the amount of sulfate present in a sample of lawn fertiliser.



- (a) What assumptions were made and how do these affect the validity of this process? 3

That there were no sulfate precipitates in the discarded filtrate (slight solubility of BaSO<sub>4</sub>) and that the BaSO<sub>4</sub> was dried to completion (ie. <sup>no water</sup> constant mass). The first would result in lost SO<sub>4</sub><sup>2-</sup> and the second in an overestimation of BaSO<sub>4</sub>. Both of these would reduce the validity of the result.

- (b) It was found that 4.25 g had a sulfate content of 35%. 3

What is the mass of the dried precipitate at Step 4? Include a chemical equation in your answer.

initially  $SO_4 = 4.25 \times 35\%$   
 $= 1.488 \text{ g}$   
 $BaSO_4 = 233.37$   
 $SO_4 = 96.07$   
 $\therefore SO_4 = 41.2\% \text{ of } BaSO_4$   
 so  $1.488 = 41.2\% \text{ of final ppt}$   
 so mass of ppt in Step 4 = 3.6 g