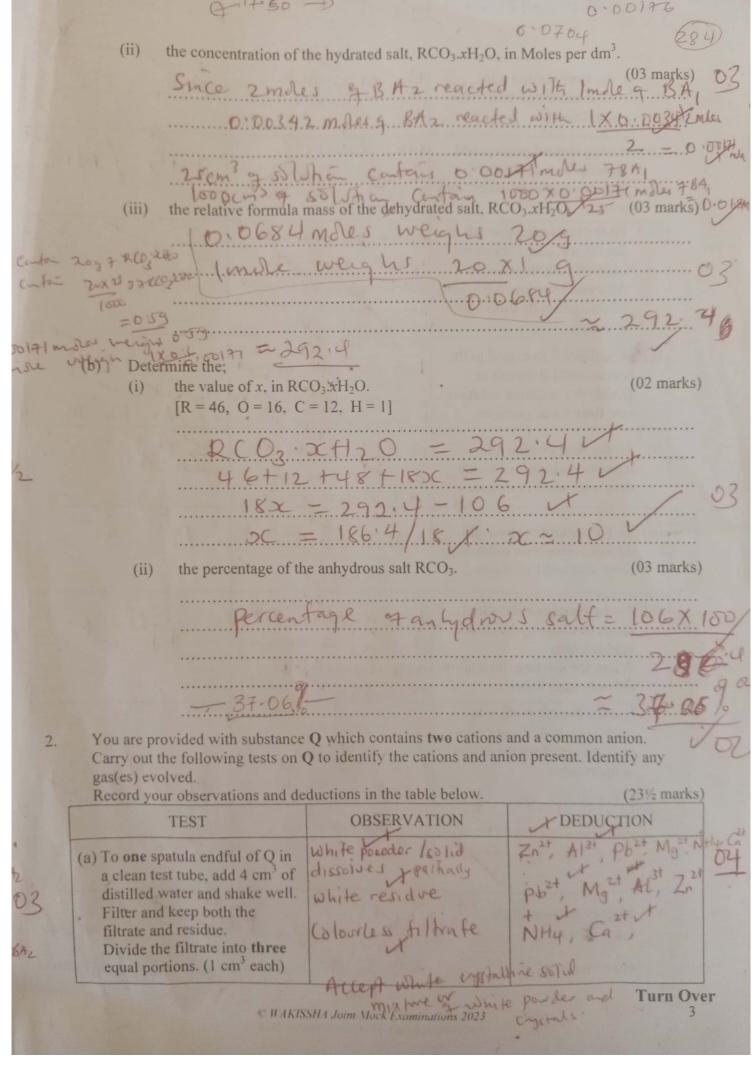
You are provided with the following; BA1, which is a solution containing 20.0 g/dm³ of unknown hydrated salt, RCO₃xH₂O. BA2, which is a 0.2 M hydrochloric acid. You are required to determine the number of Moles of water of crystallization, x, in RCO₃. xH₂O and the percentage of the anhydrous salt, RCO₃. (1 mole of hydrated salt reacts with 2 moles of hydrochloric acid) Procedure Pipette 25.0 cm³ (or 20.0 cm³) of BA1 into a clean conical flask using a clean pipette. Add 2-3 drops of Methyl orange indicator and titrate it with BA2 from the burette. Repeat the procedure above until you obtain consistent results. Record your results in the table below. Results: 15100:01 (½mark) Volume of pipette used = Final Burette reading (cm³) Initial Burette reading (cm³) D.00. Volume of **BA2** used (cm³) 17.50 x (71/2 marks) Titre values of BA2 used to calculate the average volume. Average volume of BA2 used. (a) Calculate: the number of moles of BA2 that reacted. (03 marks)

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|--|---|---|-----------------------|----|
| | (i) To the first portion add aqueous ammonia drop wise until in excess. | No observable colour change | NH4, Ca2+ 07 | L |
| | (ii) To the second portion add aqueous sodium hydroxide drop wise until in excess and warm. | No precipitate, Colourless gas that turns moist red litmus paper blue | NH3 / NH4 2+ | 2 |
| | (iii) To the remaining portion of the filtrate, add 3 drops of Lead (II) nitrate solution followed by dilute nitric acid solution drop by drop until in excess. | white precipitate formed clissolvers with effervescence facoloviess gas that bys mout blue times pape | CO291/CO3 31/2 | 2 |
| | (b) Add dilute Nitric acid to the residue until it dissolves. Divide the resultant solution into four equal portions. | brassives with effervered mist blue himspaper red and to form a coloriest of their | 6 CO2(9)/CO32 31 | 12 |
| | (i) To the first portion add aqueous sodium hydroxide drop wise until in excess. | White precipitate dussolves forming a colonless solution | Zn, Al, Pb2+ | 12 |
| 1 | (ii) To the second portion add aqueous ammonia solution drop wise until in excess. | White precipitate | Pb2+ Al3+ | 2 |
| resetus | (iii) To the third portion add 3 drops of-dilute hydrochloric acid solution. Warm the mixture, then allow to cool under water. | Awhite precipitate dissitues and recrystallings | Pb2+ 1 02 | 2 |
| | (iv) Use the fourth portion to carry out a test of your own choice to confirm the cation in the residue. | yellow/ | 017 /0121 | |
| | Add 3 drops of potassium lodide solution to the fronth | precipitate formed | 16-12/16/ | 2 |
| | (e) Identify the ions in Q; | CO3 X | 2t (01 mark) (½ mark) | |
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