

CHEMISTRY 3.2 Paper 1 Write-on version

Determine the composition of
an oxidant or reductant by titration

Credits: Two

INSTRUCTIONS

Answer the question

You are advised to spend 20 minutes answering this question.

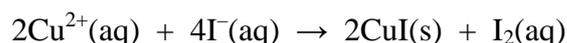
Bursary 2001 Question 7: modified

Analysis of brass

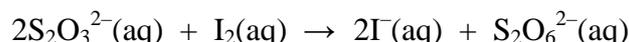
Brass is an alloy of copper and zinc. The percentage of copper present in brass can be determined by volumetric analysis. All the copper in a sample of brass, when reacted with concentrated nitric acid is converted to Cu^{2+} ions.

The copper ions are then analysed as follows:

Reaction A Copper ions (Cu^{2+}) react with iodide ions (I^-):



Reaction B The iodine formed reacts with thiosulfate ions:



1 Describe TWO observations that will be seen as **Reaction A** proceeds.

2 What colour change would be seen in **Reaction B**?

3 A student weighed a 2.15 g sample of brass and reacted it completely with concentrated nitric acid to convert all the copper atoms to copper(II) ions. The solution was made up to 250 mL in a volumetric (standard) flask.

25.00 mL samples of the solution containing Cu^{2+} were pipetted into conical flasks and excess potassium iodide solid was added. Iodine was formed. The mixture in each conical flask was then titrated with 0.102 mol L^{-1} sodium thiosulfate solution. Starch solution was added near the end point.

The results are given below.

Sodium thiosulfate	1	2	3	4
Final volume /mL	26.05	49.20	24.95	49.65
Initial volume /mL	0.35	24.65	0.30	25.05
Volume used /mL	25.70	24.55	24.65	24.60

Calculate the percentage of copper in the brass. A M E