III   the impurity present in the product at **U**.   (1 mark)

    (iii)   State two functions of the diaphragm.   (2 marks)

(c)   Give one industrial use of the product at **U**.   (1 mark)

Candidates were required to:

➤ explain how sodium carbonate can be used to purify brine containing soluble calcium and magnesium salts.
➤ write equations for the reactions which occur at the anode and the cathode of a diaphragm cell.
➤ state the functions of the diaphragm
➤ name the products of the electrolysis of brine and the use of one of the products (NaOH).

Weaknesses

Nearly all the candidates did not seem to know how sodium carbonate can be used to purify brine. Some wrote "sodium ions react with calcium and magnesium ions hence removing them', 'dissolve brine in water then add sodium carbonate'. Others left the part unanswered.

Candidates were required to realize that Ca^{2+} and Mg^{2+} exist in brine just like they do in hard water. Solid sodium carbonate has no effect on Ca^{2+} and Mg^{2+} ions and that for a reaction to occur the CO^{2-}_3 ions have to be free. This could be achieved by dissolving the sodium carbonate in a small amount of water. Once the CO^{2-}_3 ions are free, they would combine with the Ca^{2+} and Mg^{2+} to form solid $CaCO_3$ and $MgCO_3$ which can be removed from brine by filtration.

This was a question on application of knowledge of the reactions of sodium carbonate. Teachers should try to relate particular chemical reactions to their applications in real life situations. This way the students would be able to see the use of the subject in practical situations, they would be highly motivated and would like to know even more. Study of chemistry would become enjoyable.

Other weaknesses noticed:

➤ Equations were poorly written. Students are reminded that for an equation to earn marks it should be *balanced* and state symbols must be shown and must be correct.
➤ The function of the diaphragm was not known to many candidates.
➤ Impurities present in the product 'U' were not known.
➤ The product 'U" was also not known.