minutes, the solution was filtered. The total solids determined on the filtrate was 0.45 gms 100 cc.

DISCUSSION

Water yield. About 80 per cent. water recovery was obtained in the above experiment. The unrecovered water was retained in the urate precipitate. Additional water loss would occur if dry Ag_2O was used; for in the above experiment the Ag_2O was made from $AgNO_3$ and was not completely dry.

Toxicity. There is no reason to believe that the final product would be toxic. The small amount of dissolved materials (0.58 per cent.) is apparently composed of urates (0.13 per cent.) and an undetermined fraction (0.45 per cent.). This latter is probably sulfate (see above); since theoretically there should be 0.41 per cent. sulfate, calculated as Na_2SO_4, remaining in solution. In molarity, this is 0.029 moles per liter which is of sufficiently low concentration to serve as drinking water.

Taste. The water has a slightly salty taste and is not unpleasant to drink.

SUMMARY

A simple chemical method is described for the removal of most of the salts from sea water. The final product, containing 0.58 per cent. dissolved material which is apparently composed of urates and sulfates, is not unpleasant in taste and is not expected to cause toxic effects if used as drinking water.

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A PRELIMINARY ELECTRON MICROSCOPE STUDY OF THE ACTIVE DEPOSIT FROM RADIOTHORIUM

EARLY investigations of the separation of active substances by the recoil method showed that a small quantity of the parent substance is always present on the collecting plate. One explanation of this phenomenon is that the active deposit consists of aggregates of atoms. When one of the atoms disintegrates by the ejection of an alpha particle the compact aggregate of atoms recoils. Some of the recoil aggregates are deposited on the collecting plate. Lawson[1] found conclusive evidence for the theory in a study of polonium active deposit and named the phenomenon "aggregate recoil." Chamié[2] proved the existence of aggregates in the active deposits of thorium, actinium and radium by her radioautograph technique. Harrington[3] also found evidence of aggregates in radium active deposit.

After repeating a Chamié radioautograph with an active deposit of thorium, a new technique, that of observation with the electron microscope, was used for a visual investigation of the nature of the active deposit. The usual specimen holder, collodion film supported on 200-mesh copper screen, was the surface on which the active deposit of thorium was collected. The screens were photographed in place in the microscope. The photographs were enlarged to give a final magnification of 80,000 × for convenient observation and measurement of particle size.

Samples which had been exposed to the emanations from radiothorium for three, five and eight days were observed. The three-day sample exhibited diffuse spots ranging in size from 20 to 50 millimicrons in diameter. The median diameter was 29 millimicrons. The particle size range of the five-day sample was from 12 to 50 millimicrons with a median diameter of 21 millimicrons. The particle size was much smaller on the eight day sample with a range of 10 to 27 millimicrons. The median diameter was 18 millimicrons. The density of the deposit increased with increasing time of exposure to the emanations. The relative densities expressed in number of particles per square centimeter are 1, 3 and 12 for increasing exposure time. After standing for eight days, the eight-day sample was rephotographed. A deposit of uniform density was observed.

The electron microscope photographs show the aggregates in the active deposit of thorium. The change in the nature of the deposit on standing and the relation of the size distribution of the aggregates to length of exposure to thorium emanations indicates that when an atom of the aggregate disintegrates by the loss of an alpha particle the recoil force is sufficient to cause the aggregate to break up scattering the atoms in all directions.

The same phenomena, though more spectacular, have just been observed for deposits from radon. Fairly large aggregates appear after 30 minutes exposure, while after 1 hour, extraordinary small (maximum about 50 Angstrom units), sharply defined particles appear in the electron micrographs.

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