Commun. Fac. Sci. Univ. Ank. Series B
V. 6, pp 97–101 (1989)

AYVALIK SALT WORKS

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ABSTRACT

Ayvalık salt work is at İzmir-Ayvalık road. Total salt production is 12 000 tons per year.

Sea water is run from pond to pond. Na^+, K^+, Ca^{+2}, Mg^{+2}, SO_4^{-2} and Cl^- ions are concentrated by solar evaporation. The ions were determined from 5th pond to crystalizeer pond. Results are similar in Çamalti Salt Work.

INTRODUCTION

Ayvalık Salt Works is at İzmir-Ayvalık road. Its total surface area is a square kilometer. Earlies, during winter and early spring, rising seawater was kept cut of the harvest area by the dike. In summer, this area was evaporated to dryness and harvesting was commenced. The pond system was constracted in 1982. Total salt production at Ayvalık Salt Works is reported at 12 000 tons per year. Some area is not used, however, it is desired to use to increase the production to 20 000 tons per year (Tekel 1984).

1. THE PRODUCTION OF SALT

The flowchart for Ayvalık Salt Works is given in figure 1. It runs from pond to pond. It takes one month until it reaches pond 15. Table 1 shows the concontrations of some ponds.

2. EXPERIMENTALS

The determination were carried out according to the following methods.

Sodium and Potassium: They were determined by flame emission method.

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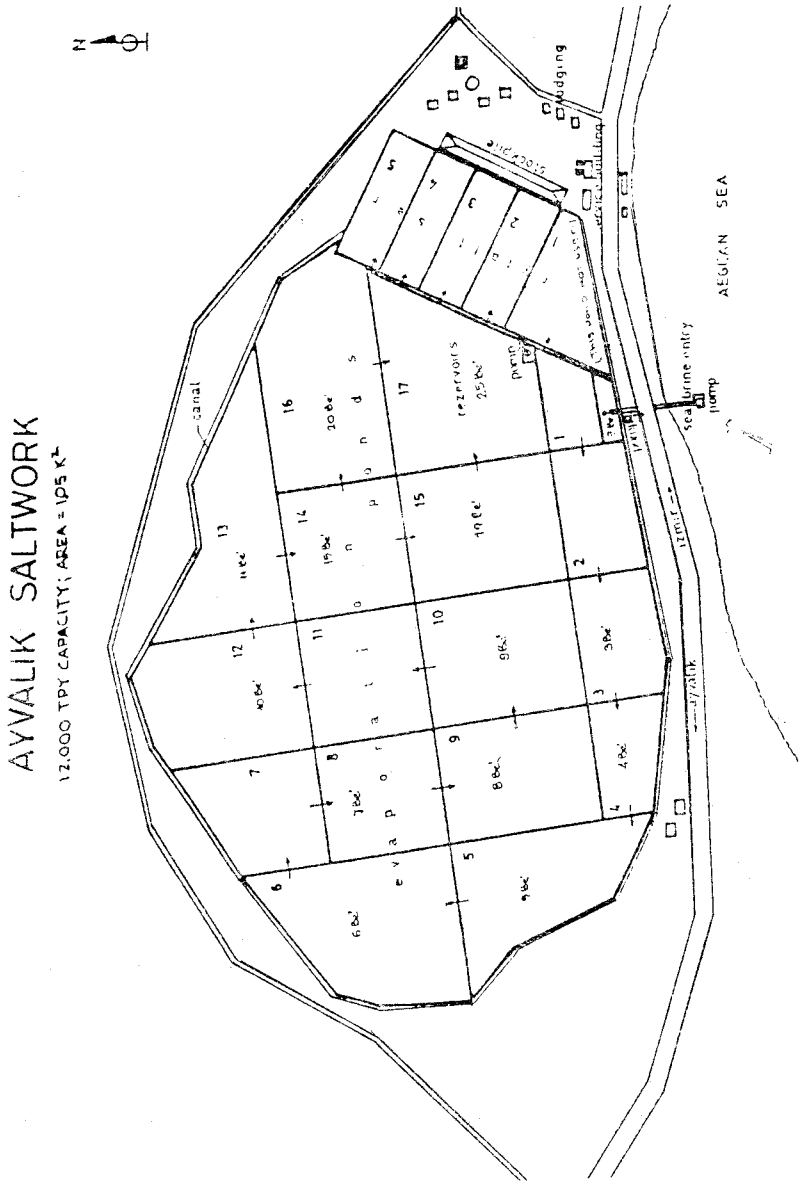

Figure 1. The flowchart for Ayvalık Salt Works

Magnesium and Calcium: They were titrated with a standard EDTA solution.

Chloride: It was titrated with a standard silver nitrate solution using Mohr method.

Sulfate: It was titrated with a standard barium chloride solution the endpoint indicated by Alizarin Red S indicater (Butts, D. 1972).

Table 1. The concentrations of some ponds.

Number of ponds	Concentration °Be
5^{th}	4
12^{th}	5
6^{th}	6
7^{th}	7
10^{th}	8
14^{th}	10
15^{th}	12–13
9^{th}	14–15
$8–16^{th}$	21–22
17^{th}(Reserve)	25
Crystalizeer	29–30

Reagents: 0.10 molar ammonium sulfate standard solution. 0.1 molar barium ehloride, Alizarin Red indicater 2%(ARS), sodium hydroxide solution (20%), 0.1 molar perchloric acid solution and methanol.

Apparatus: Buret, pipet, beakers, pH meter and miscellaneousu labware,

Procedures:

a) Titrate 25 ml 0.1 molar ammonium sulfate, diluted to 50 ml with distilled water, with barium chloride as prosedure steps c–g. Determine the sulfate in sample.

b) Pipet an aliquot of the prediluted brine into a beaker, dilute to 50 ml.

c) Add 50 ml methanol and adjust solution to pH 3 to 3.5 with porchlorisc acid.

d) Add 5 drops ARS and titrate the solution to the first appearence of pink, while stirring.

c) Continue stirring for five minutes and the color will revert to yellew.

f) Continue the titration dropwise to the first permanent pink, (a completed titration is indicated by a pink color to the precipitate)

g) Record the volume of barium chloride used.

Calculations:

a) Calculate the barium chloride standard factor.

240.25/ml of $BaCl_2$ titrated = mg SO_4^{-2}/ml $BaCl_2$

b) Calculate the percent sulfate in the sample:

$$\frac{\text{Titration volume x } BaCl_2 \text{ factor x Dilutaion volume}}{\text{Aliqout size (ml) x sample weight(g) x 10}} = \text{Percent sulfate}$$

c) Calculate the ion concentration as g/l, using percent sulfate and density of brine, tablo 2.

Table 2. Ion concentration of ponds of Ayvalık Salt Works(g/l).

°Be	Na^+	K^+	Mg^{+2}	Ca^{+2}	SO_4^{--}	Cl^-
4	10.8	0.8	2.14	0.25	4.6	23.4
5	13.75	1.2	2.60	0.22	5.4	28.339
6	16.25	1.4	3.32	0.25	7.0	36.65
8	25.0	1.7	4.16	0.20	8.6	45.50
10	31.25	2.4	5.78	0.24	12.5	61.03
12	45.0	3.2	6.68	0.24	13.7	69.06
14	55.0	4.0	8.34	0.26	16.3	82.28
18	8.25	4.8	10.85	0.22	21.38	119.58
21	95.0	8.2	13.38	0.22	24.90	135.85
25(Reser)	125.0	14.4	17.14	0.25	33.60	—
29(Crys)	105	10.0	18.09	0.24	47.62	—

DISCUSSION

The Ayvalık Salt Works is 100 kilometers to the north of Çamaltı. The composotion of its solitions are similar to Çamaltı (Özbay, 1976).

Since Ayvalık Salt Works is built on only a square kilometer area. Its potential in producing something but it is limited with a small quantity of sodium chloride. Of course, it is possible to expand out into the Agean Sea, but that will not be effective when compared to much cheaper expansion possibilities at Çamaltı.

Compared with salt produced by large exporters of the world, Çamaltı salt is of relatively at a low grade and color. It can not be

competed with salt works of the French, Tunusia and other Mediterranean Sea salt works at the present time.

Çamaltı has a potential of producing large quantities of pure white salt and can be made to compete on the export market. In order for this to happen, a change in operation and harvest techniques are necessary.

The Ayvalık Salt Works could be the centre of research to develope the Çamaltı products.

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