Determination of the Amounts of Boron and other Elements in Water at Boron Industry Regions by ICP-OES Spectrometer

Y. Erdoğan, C. Yenikaya, O. M. Kalfa, N. Atar
Dumlupınar University, Faculty of Art and Science, Department of Chemistry, Kütahya

ABSTRACT: The damage of boron industry wastes were known and it was the the subject of many studies for years. According to the report of D.S.İ, the harmless boron concentration in drinking and irrigation water was 3,75 ppm . In this study, the concentration of boron and other elements were determined in the samples, taken from housewater and irrigation water resources at .boron industry regions, by ICP-OES spectrometer.

1. INTRODUCTION

Boron minerals are the major ore of Turkey. Due to having a wide usage area, they have a great importance (Erdoğan et all., 1998). When boron concentration increases in earth and water, it shows herbicide effect. As a result of a large number of studies on utilization of rich boron rezerves in Turkey, the boron amount in surface water, underground water and agricultural areas increased (B.S. ŞAYLI, 2004). In this study, boron and the amounts of other elements in drinking water and Lepçek well water from Eskişehir-Kırka Boron Plant were investigated by ICP-OES spectrometer. According to the report of D.S.İ, the harmless boron concentration in drinking and irrigation water was 3,75 ppm (Savaş, M., 1994)

ICP-OES Spectrometer itself is usually used to detect trace amounts of elements, which after being atomized and heated, show characteristic sharp emission lines.

2. MATERIALS AND METHOD

Samples were supplied according to sample gathering techniques from Eskişehir-Kırka Boron Plant. Afterwards, results were taken from ICP-OES spectrometer and given as a table above.

3. RESULTS AND DISCUSSION

Concretion values of the elements in water samples are given in Table 1-2 above;

Table 1. Amounts of elements in Lepçek Well Water sample

Element	Concentration (ppm)	Element	Concentration (ppm)
Dy		Au	
B	2,040	V	
Ti		Yb	
Bi		Er	
Cd		Zr	
Ba		Tl	
Co		Pb	
Cs		Li	
U		K	2,404
Nb		Ca	33,69
Ru		Sr	0,262
Th		Sc	
W		S	
Be		Ni	
P		Cu	
Pt		Na	22,25
Al		Rh	

Table 2 Amounts of elements in Drinking Water

Element	Concentration (ppm)	Element	Concentration (ppm)
Dy		Au	
B		V	
Ti		Yb	
Bi		***Er***	
Cd		Zr	
Ba		XI	
Co		Pb	
Cs		Li	
U		K	2,048
Nb		Ca	41,14
Ru		Sr	
Th		Sc	
W		S	
Be		Ni	
P		Cu	
Pt		Na	11,82
Al		Rh	

4. CONCLUSION

In the route of determination of the elements in boron minerals and boron industrial wastes, element determination in water at boron industry regions was performed by the same technique As seen from the results that, Lepçek well water that is used as feed-water in Eskişehir-Kırka Boron Plant, contains no determinated harmful element that will threat human or environment health The boron amount of the sample is above 3,75 ppm which is the optimum value

As Lepçek well water, by determination of elements in the drinking water of Eskışehır-Kırka Boron Plant, there is no determinated harmful element that can threat human or environment health In addition, boron concentration cannot be determinated

As a result.

1 By enlarging the contents of the study, the element determination must be done with samples that will be taken from all boron industrial regions

2 Not only the water samples, also the plant and agricultural products must be examined

3 In addition to all this studies, by element determination of boron ores and boron industrial wastes, Turkey's boron map must formed

REFERENCES

Savaş, M, "Etıbank Emet Kolemanıt işletmesi Gölet Atıklarının Zenginleştirme Olanaklarının Araştırılması", Osmangazı Üniversitesi, 1994

Y , Erdoğan, M , Aksu, A , Demirbaş, Y , Abalı, "Analyses of Boronıc Ores and Sludges and Solubilities of Boron Minerals in $C0_2$-satureted Water", Resources, Conservation and Recycling 24,275-283,1998

B S Şaylı, "Bor minerali ve insan Sağlığı" IJ Bor Çalıştayı, Karaelmas Üniversitesi, Zonguldak, 2004