

Study of copper and other trace elements in ground water of Dabra block, Gwalior, (M.P.)

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ABSTRACT

30 Ground water samples collected from Dabra Block (Gwalior District) were analyzed for Cu, Mn, Fe and Boron. Average was found for Cu, Mn, Fe and Boron were 0.11, 0.09, 0.28, 0.015 Mg/L respectively.

Key words: Trace elements, Ground water, Dabra block, Gwalior.

INTRODUCTION

Water one of the most abundantly available material on the earth is 70-80% of the earth crust. Ground water is a primary source of water in several towns and in rural areas and plays an important role in overall balance of environment. The quality of ground water is continuously changing as a result of natural and human activities. The physiological importance of trace elements in agriculture is well known while some of the elements like iron manganese, zinc and copper are considered to be essential micro nutrients the elements like lithium and boron have been found to be toxic to plants even in small quantities beyond certain limits. In the present investigation an attempt has been made to determine the concentration of copper and some trace elements viz- Mn, Fe and Boron.

MATERIAL AND METHODS

The water samples were collected from different station. . Samples for analysis were collected in sterilized bottles (plastic). The determination Copper and some trace elements was carried out by Visible-UV spectrophotometer, (128) Copper Batho cuproine method Iron-phenanthroline

spectrophotometric method Boron-curcumin spectrophotometric method

Manganese-persulphate spectrophotometric method.

The water have been classified into 3 groups on the basis of electrical conductivity (micromhos per cm at 25 °C) each class average , minimum and maximum concentration of each elements was determined .EC values of the ground water samples under investigation were measured using systronic EC meter.

RESULTS AND DISCUSSIONS

Copper is essential nutrition to plants and animal. Most copper minerals are relatively insoluble little concentration of copper comes in water from natural origin .It is not accumulative poison, excreted by the body and very little amount is retained desirable limit 0.05mg/L, maximum 1.5 mg/L. Copper in ground water samples were varied from 0.02 mg/L to 0.24 mg/L.

The maximum permissible limit for Iron in Drinking water, prescribed by W.H.O. is 0.3-ppm, and I.S.I. has maximum limit 0.3 ppm. High in take

may cause bacterial activity (redrot disease). Iron in ground water samples were varied from 0.000 mg/L to 0.60 mg/L. Manganese is essential nutrient for animal and plants. In agriculture deficiency may cause improper growth, disrupt the nervous system and interfere with reproductive system. High intake may cause manganese disease. Highest desirable limit for drinking water 0.1 mg/L. Manganese in ground water samples were varied from 0.000 mg/L to 0.39 mg/L.

Boron is essential to the normal growth of all plants, but the concentration required is very small and if exceeded may cause injury. Plant species vary both in boron requirements and in tolerance to excess boron, so that concentrations necessary for the growth of plants having high boron requirements may be toxic for plants sensitive to boron. Boron in ground water samples were varied from 0.00 mg/L to 0.04 mg/L.

Table 1:

E.C Class and range	No. of samples	Copper/ M ^N -M ^X	Iron A/M ^N -M ^X	Manganese A/M ^N -M ^X	Boron A/M ^N -M ^X
A-(0-1000)	4	0.05/0.02-0.08	0.27/0.10-0.50	0.03/ Nil-0.08	0.01/ Nil-0.02
B-(1000-2000)	16	.14/0.06-0.24	0.39/Nil-0.60	0.04/ Nil-0.16	0.021/ Nil-.04
C-(2000-3000)	10	.11/0.04-0.19	0.11/Nil-0.21	0.21/ .05-.39	0.01/ Nil-0.03
Total	30	0.11/0.02-0.24	0.28/Nil-0.60	0.09/ Nil-0.39	0.015/ Nil-0.04

All (Cu, Fe, Mn, B) the values are in mg/L, except E.C., E.C. is in micromhos per cm at 25°C, M^N = minimum value, M^X = maximum value
A = Average value

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