



**ASSESSMENT OF MAGNESIUM CONTENT IN INDUSTRIAL EFFLUENT
OF RURAL PARTS OF NIPANI TOWN AND ITS IMPACT ON
HUMAN HEALTH**

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ABSTRACT

Magnesium has smaller ionic radius and greater charge density. Therefore, it tends to form a sheath of six water molecules in octahedral co-ordination. Generally, because of lower geochemical abundance of magnesium compound to calcium, its concentration in water bodies is lower, fresh water shows magnesium concentration below 4.0 mg/L. For present study, the surface water i.e. pond (water sample) were collected in the vicinity of sugar factory and analysed every month throughout the year. So, we have studied the total hardness in pond water sample. Magnesium was extremely low was 1.98 mg/L.

Key words: Industrial effluents, Pollutants, Magnesium.

INTRODUCTION

Due to increase in discharge of industrial effluents, domestic waste, washing cattle, bathing in the vicinity of sugar factory in industrial effluent and pond water samples are depicted. There are in accordance with earlier findings that pollution due to industrial waste and sewage are contributors to enhance magnesium content in water.^{1,2}

In the present study, the levels of magnesium were studied in the vicinity of Halsiddhanath sugar factory located at Nipani. The pond water samples were taken from twelve ponds in the glass bottles by following standard procedure. Samples were taken from twelve pond water samples, which are located at 1. Bhim Nagar, 2. Nagoba lane, 3. Kharade lane, 4. Namar mal, 5. Shivaji Nagar, 6. Andolan Nagar, 7. Kmgar Chowk, 8. Ambale polt, 9. Mestri Nagar, 10. Ramling Temple, 11. Mestri Nagar, 12. Bhise lane. The samples were collected every month throughout the year and analyzed in laboratory for the levels of magnesium.³

EXPERIMENTAL

Methodology for determination of magnesium

The concentration of magnesium was estimated by subtracting the calcium content from the total hardness. Concentration of magnesium ions was calculated using following formula:

$$\text{Magnesium (mg/L)} = a - b \times 400.8 \text{ mL of Sample} \times 1.645$$

Where, a = mL of EDTA used in total hardness determinate and b = mL of EDTA used in calcium determination.

RESULTS AND DISCUSSION

Magnesium has smaller ionic radius and greater charge density. Therefore, it tends to form a sheath of six water molecules in cathedral co-ordination.^{4,5} Generally because of lower geochemical abundance of magnesium, compound to calcium, its concentration in water bodies is lower, fresh water to show magnesium concentration below 4.0 mg/L. On this background, an average concentration of magnesium in pond water from minimal 1.98 mg/L. to maximal 219.51 mg/L. (Table 1). Lowest concentration was observed in summer in pond water sample was 12.45 mg/L, during rainy season was 19.61 mg/L and higher in winter was 14.85 mg/L (Table 2).

According to items (1970) waters predominant in magnesium content are unusual.^{6,7} It was explained that water near or above saturation with respect to calcium must have lost some calcium by CaCO_3 precipitation and thus water attains predominance with respect to magnesium.⁸ Otherwise in normal situations, calcium is a predominant cation followed by magnesium. Its stationwise, month wise and season wise fluctuating profiles as a function of contributing from industrial effluents, domestic wastes, washing cattle's bathing in the vicinity of sugar factory in industrial effluent and pond water samples are depicted in tables.

Table 1: Magnesium in pond water sample during the monitoring period

Stations	Jan.	Feb.	Mar.	Apr.	May	Jun	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	16.29	16.51	7.07	6.32	11.30	16.17	20.40	3.27	6.25	7.25	8.28	9.51
2	12.60	14.13	12.50	8.50	8.34	8.25	14.72	4.39	6.30	7.21	9.72	13.40
3	15.10	8.70	23.70	3.85	9.75	15.07	13.65	36.70	7.19	8.17	11.60	19.25
4	14.12	8.75	11.60	5.81	11.90	18.04	26.30	6.25	7.15	8.15	11.62	20.71
5	20.41	4.81	35.70	7.82	20.40	17.51	20.46	7.35	7.25	8.51	19.51	20.71
6	21.80	17.06	30.14	4.85	12.67	20.95	13.17	16.31	7.12	8.14	19.40	21.60
7	19.40	16.05	24.20	2.95	10.72	10.21	13.17	14.47	8.15	8.17	26.25	27.30
8	40.42	144.70	3.85	6.32	13.17	7.88	16.07	6.32	7.25	8.17	12.81	8.77
9	5.36	1.98	6.81	4.37	21.48	13.17	6.30	6.75	8.15	9.15	8.70	9.05
10	9.20	3.42	8.25	2.44	16.50	7.30	2.40	6.35	7.14	7.17	14.13	11.21
11	8.21	2.91	7.21	5.37	16.72	5.38	23.31	69.21	8.15	10.15	9.27	9.02
12	8.75	2.43	6.32	15.14	13.62	56.21	8.30	9.21	10.30	12.15	41.31	35.15

Table 2: magnesium (mg/L) in pond water sample during the monitoring period

Stations	Average	S.D
1	10.72	5.36
2	10.01	3.37
3	14.39	8.91
4	12.53	6.31
5	15.87	8.96
6	16.10	7.30
7	15.09	7.78
8	22.98	39.53
9	8.44	4.97
10	7.96	4.36
11	14.58	18.06
12	18.24	16.66

CONCLUSION

In the present investigation, it is found that disposal of sewage and industrial wastes are the major sources contributing to Magnesium content in water.

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