Bulletin of Nexus
Multidisciplinary International Research Journal, Double-Blind Peer Reviewed, Open Access Journal
ISSN : 3065-7865 / Volume-3, Issue-1 ,January 2026

Original Article

Determination of Chloride Ion Concentration in Various Drinking Water sources in and around Indapur City (MH)

Rajendra R. Bhosale,
Department of Chemistry, A.S.C.College Indapur,Dist-Pune

Manuscript ID:
BN-2026-030121

ISSN: 3065-7865

Volume 3

Issue 1

January 2026

Pp.106-108

Submitted: 20 Dec 2025

Revised: 30 Dec 2025

Accepted: 15 Jan 2026

Published: 31 Jan 2026

DOI:
10.5281/zenodo.19275457
DOI link:
https://doi.org/10.5281/zenodo.19275457

Abstract

In drinking water high levels of chloride ion content can indicate various health issues and may shows symptoms like taste confusion, weakness and fluid retention. It can may be a sign of dehydration or kidney problems, to avoid this, it's important to use proper purification treatment. For drinking water, chlorination is very important process for disinfection. Chloride ion concentration was determined mostly by using Mohrs method. In present study, amount of chloride ion concentration was determined for various sources of collected drinking water samples from in and around Indapur City. The results of Bore water samples were to be between 89.1 mg/L and 274.8 mg/L , for Well water results were in between 159.0 mg/L to 414.6 mg/L, for purification plant water samples results were in between 36.1 mg/L to 72.3 mg/L and for marketed drinking bottle water were in between 31.3 mg/L to 45.8 mg/L, for home filter water samples results were in between 28.9 mg/L to 45.8 mg/L . Chloride ions level of some samples from well water and bore water were found to beyond limits of WHO. So, there is a necessity to apply strict controls for chloride ion concentration for that drinking water sources in and around Indapur City.

Keywords: *Chloride ion, drinking water, Mohr's method, disinfection.*

Introduction:

Water used for drinking purpose from various sources like rivers, lakes and groundwater founds number of pathogenic microorganisms. Out of all microorganisms some are harmful to human health. They may cause some waterborne diseases in humans. In water sources, it can be transmitted through a drinking water purification and distribution system, causing waterborne disease in those who consume it [1]. In order to control waterborne diseases, different disinfection methods were used to prevent and destroy unwanted microorganisms. Generally, some water treatment processes such as coagulation, adsorption- column chromatography, Reverse Osmosis, sedimentation, filtration and chlorination convert water that is safe for public consumption and domestic purpose [2,3]. More than 10 decades, many public water purification systems add chlorine for the purpose of disinfection. Disinfection process kills or inactivates harmful microorganisms which can cause 80% waterborne diseases such as typhoid, cholera, hepatitis and giardiasis [4].

Now a days chlorination process can be achieved by adding liquefied chlorine gas in the form of elemental chlorine, sodium hypochlorite or calcium hypochlorite solution and dry calcium hypochlorite in drinking water. After adding these in drinking water sources, they release "free chlorine," in water, which destroys pathogenic (disease producing bacteria) micro-organisms [5]. The benefits of chlorination process were i) to reduces many disagreeable tastes and odors. ii) to eliminates slime bacteria, molds and algae that commonly grow in water supply reservoirs and in storage tanks. iii) to removes chemical compounds that have unpleasant tastes and hinder disinfection. iv) it helps to remove iron and manganese ions from raw water sources.

The main objective of this research is the determination of amount of chloride ion concentration in samples from various drinking water sources of Indapur city area by Mohrs method.

Address for correspondence:
Rajendra R. Bhosale, *Department of Chemistry, A.S.C.College Indapur,Dist-Pune*
Email: *drrbpu1968@gmail.com*

How to cite this article:
Bhosale, R. R. (2026). Determination of Chloride Ion Concentration in Various Drinking Water sources in and around Indapur City (MH). Bulletion of Nexus, 3(1), 106–108.
https://doi.org/10.5281/zenodo.19275457

Quick Response Code:

Website: https://bnir.us

Materials And Methods:

Sample collection:

A total of 50 samples from drinking water sources in and around Indapur city were collected at morning. 10 samples were collected separately in plastic container from each source like Bore water, well water, Purification plant water, Domestic filter water and marketed bottled water labeled by various companies. Analysis was conducted during the same day of bringing the samples. All collected samples were analyzed separately in laboratory of Department of Chemistry, A.S.C.College Indapur, Dist-Pune, during the period of 1 May 2024 to 31 May 2024.

Method of analysis:

Mohr's method is used for the determination of chloride ions in all water samples by using AR grade chemicals. In this method titration of collected water samples from different sources separately with standard solution of 0.02N Silver Nitrate, using 5% potassium chromate solution as an indicator. [6]

Results And Discussion:

In this study, chloride ion concentration was determined in all of 50 samples of drinking water sources in and around Indapur city. The result of chloride ion concentration of drinking water were in between the standard values prescribed by standard institutes as shown in table1 [7,8]. The average values of chloride ion concentration was found to be in between 37.1 mg/L and 243.9 mg/L. Results were presented in table 2 and 3. It was found that, chloride ion concentration in all drinking water samples were within internationally accepted limit which is less than 250 mg/L.The WHO drinking water quality guideline for chloride ions is an Aesthetic Objective (AO) of less than or equal to 250 milligrams. At concentrations of chloride ions higher than 250 mg/L, the sodium associated with chloride may be a concern to people on sodium-restricted diets [9].

Table 1. Average values of all samples compared with the Standard.

Standards	HDLin ppm	MPL in ppm
WHO Standard	200	600
ISI Standard 1991	250	1000
ICMR Standard	200	1000
UAPH Standard	250	600
Average of all Samples	37.1	243.9

HDL- Higher desirable limit. MPL- Maximum permissible limit.

Table 2. Comparison of number of Chlorides in various sampleSample No.→	1	2	3	4	5	6	7	8	9	10	Average
Sources↓	Amount of Chloride present (in ppm)										
Bore	147	161.5	137.4	89.1	115.7	274.8	115.7	113.2	207.3	118.1	137.9
Well	159	168.7	171.1	414.6	313.3	364	180.7	315.7	171.1	180.7	243.9
Home Filter	36.1	28.9	53	28.9	40.9	40.9	45.8	33.7	38.5	28.9	37.6
Purification Plant	72.3	36.1	43.3	43.3	50.6	48.2	53	53	36.1	50.6	44.3
Market Bottle	40.9	31.3	31.3	33.7	38.5	45.8	40.9	33.7	40.9	33.7	37.1

Table.3 Shows Cl^- & other contents of Packaged Market Drinking Water samples

Sa. No	Brand Name	Na mg	Ca mg	K mg	Mg mg	Cl^- conc.
1	Oxycool	0	0	2	5	40.98
2	Nature Delight	0.4	0	0.2	0.4	31.34
3	Yewale	0	0	0	0	31.34
4	Oxygrannd	0	0	0.5	0.2	33.78
5	Oxygreat	0	0	0	0	38.57

6	Acquatica	0	0	0	0	45.8
7	Sinory Acqua	0	0.5	0.2	0.01	40.98
8	Oxytech	0	0	0	0	33.75
9	Acquajal	0	0	0.1	0.2	40.98
10	Acqualtima	0	0	0	0	33.75
	Average Cl^-					37.13

Conclusion:

Chlorination is a very popular method of water disinfection that has been used from many years. It has shown to be effective for controlling pathogenic microorganism, bacteria and viruses. Chlorination does continue to be the most common, dependable, and cost-effective method for water disinfection. This study showed that the concentration of chloride ion in drinking water was analyzed by Mohrs method within internationally accepted limit. Some samples require strict and continuous control for the levels of chloride ions in drinking water sources.

Acknowledgement

The author expresses sincere gratitude to the Department of Chemistry, A.S.C. College, Indapur, Dist. Pune, for providing laboratory facilities and institutional support for carrying out this research work. Special thanks are extended to all staff members and colleagues for their valuable guidance and cooperation during sample collection and analysis. The author is also thankful to the local authorities and residents of Indapur city for their support in providing drinking water samples from various sources. Finally, heartfelt appreciation is given to everyone who directly or indirectly contributed to the successful completion of this study.

Financial support and sponsorship

Nil.

Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper

References:

1. White G. The Handbook of Chlorination. 2nd Edition. Van Nostrand Reinhold Company, New York. 1986; 2nd ed.
2. American Water Works Association. Manual of Water Supply Practices: Waterborne Pathogens. Denver: American Water Works Association. 1999; 1st ed.
3. American Water Works Association. Water Quality Division Disinfection Systems Survey Committee Report. Journal of the American Water Works Association. 9; 2000: 24-43.
4. White G. Current chlorination and dechlorination practices in the treatment of potable water, wastewater and cooling water. In: Jolley RL, ed. Water chlorination: environmental impact and health effect. Ann Arbor, MI, Ann Arbor Science.1; 1978:1-18.
5. Chlorine and hydrogen chloride. Geneva, World Health Organization. (Environmental Health Criteria, No 21).1982:1-95.
6. Illinois department of public health, division of environmental health. Commonly found substances in drinking water and available treatment. 1-8.
7. Bhosale R.R. Study of Physicochemical parameters of Bijawadi Lake, Indapur,Pune (MH), IJMR, Vol.I, Issue 12(II), ISSN:2277-9302, March 2013.
8. Sheen R T and Kahler H L. Effects of Ions on Mohr Method for Chloride Determination, Ind. Eng. Chem. Anal. Ed. 10(11); 1938: 628-629.
9. Copenhagen, WHO Regional Office for Europe. Sodium, chlorides, and conductivity in drinking water: a report on a WHO working group. 1978 (EURO Reports and Studies 2).