

## Unit I

### Water Technology

#### 1.1 INTRODUCTION

Water is essential for the existence of human beings, animals and plants. Though 80% of the earth's surface is occupied by water, less than 1% of the water is available for ready use.

The main sources of water are

- Rain
- rivers and lakes (surface water)
- wells and springs (ground water)
- sea water

Among the above sources of water, rain water is the purest form of water but it is very difficult to collect whereas sea water is the most impure form.

Thus, surface and ground water are normally used for industrial and domestic purposes. Such water must be free from undesirable impurities.

*"The process of removing all types of impurities from water and making it fit for domestic or industrial purposes are called water treatment."* Before treating water one must know the nature as well as the amount of impurities.

#### 1.2 HARD WATER AND SOFT WATER

- Hard Water**

*"Water which does not produce lather with soap solution, but produces white precipitate is called hard water".*

This is due to the presence of dissolved Ca and Mg salts.



- Soft Water**

*"Water which produces lather readily with soap solution is called soft water."*

This is due to the absence of Ca and Mg salts.

#### BOILER FEED WATER

In Industry, one of the chief uses of water is generation of steam by boilers. The water fed into the boiler for the production of steam is called boiler feed water.

##### Requirements of boiler feed water

- It should have zero hardness.
- It must be free from dissolved gases like O<sub>2</sub>, CO<sub>2</sub>, etc.
- It should be free from suspended impurities.
- It should be free from dissolved salts and alkalinity.

# Engineering Chemistry 2 Notes

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## Engineering Chemistry 2 Notes:

Journal of Industrial and Engineering Chemistry ,1922      The Journal of Industrial and Engineering Chemistry ,1918  
Industrial & Engineering Chemistry ,1923      *Proceedings of the American Society for Engineering Education* ,1923  
**A Treatise on Non-metallic Materials of Engineering** Robert Henry Thurston,1900      The Sibley Journal of Engineering ,1921      Journal of the American Society of Mechanical Engineers American Society of Mechanical Engineers,1916      *Catalogue* ,1893      Annual Register of the United States Naval Academy United States Naval Academy,1906      **ASEE ... Profiles of Engineering & Engineering Technology Colleges** ,1998      Announcement University of Georgia,1908      **Engineering Education** American Society for Engineering Education,1923      Catalogue University of North Dakota,1916      Year Book ... Catholic University of America,1918      **Sessional Papers of the Dominion of Canada** Canada. Parliament,1899 Report of the Dominion fishery commission on the fisheries of the province of Ontario 1893 issued as vol 26 no 7 supplement      **Engineering and Mining Journal** ,1886      **Annual Report of the President of Stanford University for the ... Academic Year Ending ...** Stanford University,1904 Contains annual financial report reports of schools departments committees other administrative offices and publications of the faculty  
**Preliminary Report of the Commission on Industrial Education** Pennsylvania. Commission on industrial education,1889      Announcement of the University of Georgia with a Catalogue of the Officers and Students University of Georgia,1904      *Catalogue of the Officers and Students of the University of Georgia, Athens, Georgia* University of Georgia,1909

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### **Table of Contents Engineering Chemistry 2 Notes**

1. Understanding the eBook Engineering Chemistry 2 Notes
  - The Rise of Digital Reading Engineering Chemistry 2 Notes
  - Advantages of eBooks Over Traditional Books
2. Identifying Engineering Chemistry 2 Notes
  - Exploring Different Genres
  - Considering Fiction vs. Non-Fiction
  - Determining Your Reading Goals
3. Choosing the Right eBook Platform
  - Popular eBook Platforms
  - Features to Look for in an Engineering Chemistry 2 Notes
  - User-Friendly Interface
4. Exploring eBook Recommendations from Engineering Chemistry 2 Notes
  - Personalized Recommendations
  - Engineering Chemistry 2 Notes User Reviews and Ratings

- Engineering Chemistry 2 Notes and Bestseller Lists
- 5. Accessing Engineering Chemistry 2 Notes Free and Paid eBooks
  - Engineering Chemistry 2 Notes Public Domain eBooks
  - Engineering Chemistry 2 Notes eBook Subscription Services
  - Engineering Chemistry 2 Notes Budget-Friendly Options
- 6. Navigating Engineering Chemistry 2 Notes eBook Formats
  - ePub, PDF, MOBI, and More
  - Engineering Chemistry 2 Notes Compatibility with Devices
  - Engineering Chemistry 2 Notes Enhanced eBook Features
- 7. Enhancing Your Reading Experience
  - Adjustable Fonts and Text Sizes of Engineering Chemistry 2 Notes
  - Highlighting and Note-Taking Engineering Chemistry 2 Notes
  - Interactive Elements Engineering Chemistry 2 Notes
- 8. Staying Engaged with Engineering Chemistry 2 Notes
  - Joining Online Reading Communities
  - Participating in Virtual Book Clubs
  - Following Authors and Publishers Engineering Chemistry 2 Notes
- 9. Balancing eBooks and Physical Books Engineering Chemistry 2 Notes
  - Benefits of a Digital Library
  - Creating a Diverse Reading Collection Engineering Chemistry 2 Notes
- 10. Overcoming Reading Challenges
  - Dealing with Digital Eye Strain
  - Minimizing Distractions
  - Managing Screen Time
- 11. Cultivating a Reading Routine Engineering Chemistry 2 Notes
  - Setting Reading Goals Engineering Chemistry 2 Notes
  - Carving Out Dedicated Reading Time
- 12. Sourcing Reliable Information of Engineering Chemistry 2 Notes
  - Fact-Checking eBook Content of Engineering Chemistry 2 Notes
  - Distinguishing Credible Sources

13. Promoting Lifelong Learning
  - Utilizing eBooks for Skill Development
  - Exploring Educational eBooks
14. Embracing eBook Trends
  - Integration of Multimedia Elements
  - Interactive and Gamified eBooks

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