

Chemistry for Everyday Living in Our Society

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Abstract

Chemistry plays an important role in everyday human existence and societal development. Daily activities such as cooking, farming, medicine preparation, sanitation, food preservation, and industrial production depend largely on chemical processes and reactions. This study examines the relevance of everyday chemistry in society, the relationship between traditional and modern chemistry, and the importance of indigenous chemical knowledge in sustainable living. The study also discusses various applications of chemistry in agriculture, healthcare, environmental management, and domestic life. A descriptive research approach based on literature review was adopted for the study. Findings revealed that chemistry is deeply integrated into human survival and economic growth. The study further showed that indigenous chemical knowledge contributes significantly to local technology, medicine, and environmental sustainability. The paper recommends increased awareness of chemistry education, proper handling of chemicals, and integration of indigenous knowledge into modern scientific practices. Chemistry remains a major tool for improving quality of life and promoting sustainable development in society.

Keywords: Everyday chemistry, Traditional and Modern chemistry daily life, society

Introduction

Chemistry is often referred to as the central science because it links physical sciences with biological and applied sciences. According to Brown, Lemay, Burstem, Murphy, Woodward and Stoltzfus (2018), chemistry is the study of matter, its composition, structure, properties, and the changes it undergoes during reactions. Human life depends heavily on chemistry because virtually every activity carried out in society involves chemical substances and processes.

Everyday chemistry refers to the practical application of chemical principles in daily human activities. Activities such as cooking, washing, fermentation, preservation of food, water purification, and the use of medicines involve chemistry. As noted by Hill and McCreary (2019), chemistry helps people understand how materials interact and how chemical products improve living conditions.

In traditional societies, people practiced forms of chemistry before the emergence of modern laboratories and scientific methods. Indigenous communities developed local methods for soap making, herbal medicine, food preservation, dye production, and metal works through observation and experimentation (Aikenhead and Ogawa, 2007). Modern chemistry has expanded these practices through scientific research, technological advancement, and industrial production.

The importance of chemistry in modern society cannot be overemphasized. It contributes to healthcare, agriculture, transportation, environmental protection, and industrialization. Understanding chemistry in daily life therefore enables individuals to make informed decisions regarding health, hygiene, environmental sustainability, and resource utilization.

Statement of the Problem

Despite the importance of chemistry in everyday life, many people still perceive chemistry as a difficult and abstract subject limited to laboratories and scientific professionals. This misconception

has reduced public appreciation of chemistry and its applications in society. Inadequate understanding of chemistry often affects students' interest and public participation in scientific development.

In addition, the misuse of chemicals in homes, agriculture, industries, and healthcare has contributed to environmental pollution, food contamination, and health hazards. Many indigenous chemical practices are also gradually disappearing due to modernization and lack of proper documentation. There is therefore a need to examine the role of chemistry in everyday living, identify the relationship between traditional and modern chemistry, and emphasize the importance of indigenous chemical knowledge for sustainable societal development.

Purpose of the Study

The main purpose of this study is to examine the role of everyday chemistry in human living and societal development.

The specific objectives are to:

1. Explain the role of chemistry in everyday life.
2. Examine the relationship between traditional and modern chemistry.
3. Identify the applications of chemistry in society.
4. Discuss the importance of indigenous chemical knowledge.
5. Suggest measures for promoting chemistry education and responsible chemical use.

The significance of study

The significance of studying chemistry for everyday living in our society has the following roles to play;

Everyday chemistry explains things we often take for granted—such as cooking food, cleaning with soap and detergents, digestion in the body, rusting of metals, burning of fuels, and even the medicines we take. When people understand these processes, they are less likely to misuse substances and more likely to adopt safe and effective practices in their homes and communities. One major importance is health and hygiene awareness. For example, understanding how disinfectants and soaps work helps people prevent diseases by properly cleaning hands, water, and surfaces. It also helps in understanding how drugs work in the body and why correct dosage is important. It is also important for environmental protection. Everyday chemistry helps people understand pollution, waste management, recycling, and the effects of chemicals on air, water, and soil. This knowledge encourages responsible disposal of waste and reduced use of harmful substances like plastics and toxic chemicals.

In terms of food and nutrition, chemistry explains food preservation, additives, fermentation, and cooking reactions. This helps individuals prepare safer, healthier, and more nutritious meals while avoiding food spoilage and poisoning.

Another key significance is economic and practical living skills of chemistry. Understanding how materials like soaps, paints, fuels, and cleaning agents work can help people use them efficiently, reduce waste, and save money. In Overall, the study of chemistry makes individuals more informed, responsible, and capable of improving their quality of life and contributing positively to society.

The Role of Chemistry in Everyday Life

Chemistry plays a vital role in human life because it helps people understand the composition, properties, and transformations of matter. From cooking food to manufacturing medicines and cleaning products, chemistry influences nearly every aspect of daily living. One important role of chemistry is in medicine and healthcare. Pharmaceutical drugs are developed through chemical research to prevent and treat diseases. For example, common medications such as Paracetamol and antibiotics are products of chemical synthesis. Brown, Lemay, Burstern, Murphy, Woodward and

Stoltzfus (2018) states that understanding of chemical reactions in human body enables scientists to design effective medicines and vaccines. Chemistry is also used in medical laboratories for blood tests, diagnoses, and the production of disinfectants and antiseptics.

Chemistry is equally important in food preparation and preservation. Cooking involves chemical changes such as boiling, frying, baking, and fermentation. For instance, when bread is baked, yeast produces carbon (iv) oxide gas that makes the dough rise. According to Chang and Goldsby (2016), chemical additives and preservatives help maintain food quality and extend shelf life. Chemistry also helps nutritionists analyze the nutrients present in food to promote healthy living. Another everyday application of chemistry is in agriculture. Farmers use fertilizers, pesticides, and herbicides to improve crop production and protect plants from pests and diseases. As noted by Tro (2017), chemical fertilizers provide essential nutrients such as nitrogen, phosphorus, and potassium that enhance plant growth. Chemistry also contributes to the development of safer agricultural practices and environmental friendly farming methods.

Chemistry is essential in cleaning and sanitation. Soaps, detergents, bleach, and disinfectants are chemical products designed to remove dirt and kill harmful micro organs. During disease outbreaks such as COVID-19, the use of sanitizers and disinfectants became especially important for maintaining hygiene and preventing infections. Chemistry therefore contributes directly to public health and safety.

In addition, chemistry supports industrial and technological development. Industries use chemical processes to manufacture plastics, cosmetics, textiles, paints, fuels, and electronic materials. According to Silberberg and Amateis (2021), many modern technologies depend on chemical innovations for improved efficiency and sustainability. Chemistry also plays a key role in environmental protection through water purification, waste management, and pollution control. In conclusion, chemistry is deeply connected to everyday life and human progress. It improves healthcare, food production, sanitation, agriculture, industry, and environmental sustainability. The study of chemistry therefore helps society solve practical problems and improve the quality of life.

The Relationship between Traditional and Modern Chemistry in Our Society

Traditional and modern chemistry are closely connected because modern chemical science was developed from the practical knowledge and experiences of early societies. Traditional chemistry refers to the local and ancient methods used in producing substances such as soap, dyes, medicines, alcohol, and metals using natural materials and simple techniques. Modern chemistry, however, is a scientific discipline that studies matter, its composition, properties, and reactions through laboratory experiments and advanced technology. According to Brown, etal (2018), many scientific principles in modern chemistry originated from traditional practices carried out by ancient civilizations. One important relationship between traditional and modern chemistry is that both involve the transformation of materials for human use. Traditional societies practiced activities such as fermentation, cooking, leather tanning, and soap making without fully understanding the scientific principles involved. Modern chemistry explains these processes scientifically through concepts such as chemical reactions, acids and bases, and oxidation. Chang and Goldsby (2016) stated that many traditional chemical activities formed the foundation for the development of chemical science.

Another relationship exists in the field of medicine. Traditional medicine relied heavily on herbs and plant extracts to treat diseases and improve health. Modern chemistry studies these natural substances to identify their active ingredients and produce standardized drugs. For example, several pharmaceutical drugs used today were developed from medicinal plants used traditionally. Tro (2017) explained that modern pharmaceutical chemistry often depends on traditional knowledge to discover new medicines and improve healthcare systems.

Traditional and modern chemistry are also connected in agriculture and food production. In traditional societies, people used organic manure, natural pesticides, and local food preservation methods such as drying and smoking. Modern chemistry has improved these practices by developing chemical fertilizers, preservatives, and advanced storage systems that increase food production and reduce spoilage. According to Silberberg and Amateis (2021), modern agricultural chemistry combines scientific research with traditional farming knowledge to improve food security and environmental sustainability.

Furthermore, modern chemistry enhances traditional practices by improving efficiency, safety, and quality. Traditional methods of metal extraction, textile dyeing, and alcohol production were often slow and less accurate. Modern chemistry uses scientific measurements, laboratory equipment, and industrial technology to refine these processes and produce better-quality products on a larger scale. This relationship shows how scientific advancement builds upon indigenous and traditional knowledge.

Despite their relationship, traditional and modern chemistry differ in their approaches. Traditional chemistry mainly depends on observation, trial and error, and cultural practices passed from one generation to another. Modern chemistry, on the other hand, is based on scientific theories, experimentation, and precise measurement. Modern chemists use advanced instruments and analytical techniques to study matter in detail and develop new materials and technologies.

In conclusion, traditional and modern chemistry are strongly related because modern chemistry evolved from traditional chemical practices. Traditional knowledge provided the foundation for many scientific discoveries, while modern chemistry has improved and expanded these practices through research and technology. Both traditional and modern chemistry continue to contribute significantly to medicine, agriculture, industry, and the overall development of society.

Applications of chemistry in society

Applications of chemistry are in pharmaceuticals and healthcare.

Medicines such as antibiotics, analgesics, antacids, and vaccines are all products of chemical research and development. These drugs interact with biological systems to treat diseases, relieve pain, and prevent infections (Testbook, 2025). For example, aspirin works by inhibiting enzymes responsible for inflammation and pain. Chemistry also supports diagnostic tools such as blood tests, imaging agents, and biochemical assays used in hospitals. Without chemistry, modern medicine would not be possible.

Household cleaning products rely heavily on chemical principles. Soaps and detergents remove dirt and grease through emulsification, where molecules surround oil particles and allow them to be washed away with water. Bleaches and disinfectants kill microorganisms by breaking down their cell structures. Toothpaste contains fluoride, which strengthens enamel and prevents tooth decay. Shampoos and cosmetics are also carefully formulated chemical mixtures designed for safety and effectiveness.

Chemistry contributes significantly to agricultural productivity and food security. Fertilizers such as nitrogen, phosphorus, and potassium compounds improve soil fertility and plant growth. Pesticides and herbicides protect crops from pests and weeds, increasing yield (Vedantu, 2025).

Soil chemistry also helps farmers understand pH levels, nutrient balance, and soil health, enabling better crop management and sustainable farming practices.

Environmental chemistry focuses on protecting ecosystems and managing pollution. Water treatment plants use chemical processes such as chlorination and coagulation to remove impurities and pathogens from drinking water. Chemistry also helps in recycling waste, reducing air pollution, and controlling greenhouse gas emissions (CLRN, 2025).

For example, catalytic converters in vehicles reduce harmful exhaust gases like carbon monoxide into less harmful substances. Modern materials such as plastics, polymers, glass, and metals are all products of chemical engineering.

Polymers are used in packaging, clothing, electronics, and medical equipment. Semiconductors, which are essential for computers and smartphones, rely on controlled chemical properties of materials like silicon (Imperial College resource, 2025).

Paints, dyes, adhesives, and construction materials like cement are also developed using chemical principles to improve durability and functionality.

Energy production is fundamentally based on chemical reactions.

Fossil fuels such as petrol, diesel, and natural gas release energy through combustion reactions. Batteries store and release energy through electrochemical reactions. Renewable energy technologies, such as hydrogen fuel cells, also depend on chemistry to produce clean energy solutions (CLRN, 2025).

Chemistry is present in simple daily activities such as cooking, cleaning, washing clothes, and even breathing. For example, baking soda releases carbon dioxide during baking, helping dough rise. Rusting of iron is a chemical reaction that affects metal objects over time. Even emotions and brain functions are influenced by chemical messengers known as neurotransmitters (ThoughtCo, 2019).

Importance of Indigenous Knowledge of Chemistry in Our Society

Indigenous knowledge of chemistry refers to the traditional understanding and use of natural materials, chemical processes, and local technologies developed by indigenous communities over many generations. This knowledge is applied in areas such as medicine, food preservation, farming, soap making, metal work, and dye production. Indigenous chemical practices continue to play an important role in modern society because they contribute to healthcare, environmental sustainability, cultural preservation, and scientific development. According to Brown LeMay, Bursten, Murphy, Woodward & Stoltzfus (2018), many modern scientific discoveries originated from traditional practices and observations of natural substances.

One major importance of indigenous knowledge of chemistry is in traditional medicine and healthcare. Indigenous communities use herbs, roots, leaves, and bark to prepare remedies for treating diseases and infections. These medicinal preparations involve chemical processes such as extraction, fermentation, boiling, and drying. Modern pharmaceutical chemistry has benefited greatly from this knowledge by studying medicinal plants and isolating active compounds used in drug production. Tro (2017) explained that several modern medicines have been developed from traditional herbal remedies after scientific analysis and testing.

Indigenous knowledge of chemistry is also important in food preservation and nutrition. Traditional methods such as drying, smoking, salting, and fermentation help preserve food and improve its taste and nutritional value. Fermentation, for example, is widely used in the preparation of local foods and beverages. Modern chemistry explains these preservation techniques scientifically and has improved them through advanced food technology. According to Chang and Goldsby (2016), traditional food-processing methods provide valuable knowledge that contributes to food security and

healthy nutrition.

Another importance of indigenous chemistry is in agriculture and environmental conservation. Indigenous farmers use natural fertilizers such as compost and animal waste to improve soil fertility. They also apply plant-based pesticides and crop rotation methods to protect crops and maintain soil productivity. These environmentally friendly practices reduce pollution and promote sustainable agriculture. Silberberg and Amateis (2021) stated that integrating traditional agricultural knowledge with modern chemistry helps improve environmental sustainability and resource management.

Indigenous knowledge of chemistry also supports local industries and economic activities. Traditional communities produce soap, pottery, dyes, leather, and metal tools using locally available materials and chemical processes. For example, local soap making involves the reaction between oils and alkaline substances obtained from plant ash. These traditional industries provide employment opportunities and preserve local craftsmanship. Modern chemistry has improved the quality and efficiency of many of these products through scientific research and industrial development.

Furthermore, indigenous chemical knowledge helps preserve cultural identity and heritage. Traditional practices are passed from one generation to another and reflect the customs, beliefs, and experiences of a community. Preserving this knowledge ensures that valuable scientific and cultural information is not lost. According to Brown Lemay, Burstem, Murphy, Woodward and Stoltzfus (2018), indigenous practices provide important insights that can inspire modern scientific innovations and technological advancements.

Despite its importance, indigenous knowledge of chemistry faces challenges such as modernization, lack of documentation, and limited scientific recognition. Therefore, there is a need to preserve, study, and integrate indigenous chemical knowledge into modern scientific education and research. This will promote sustainable development and encourage respect for cultural diversity. In conclusion, indigenous knowledge of chemistry is important because it contributes to medicine, agriculture, food preservation, environmental protection, and local industries. It also preserves cultural heritage and provides a foundation for modern scientific discoveries. Combining indigenous knowledge with modern chemistry can help society achieve sustainable development and improve the quality of life.

Importance of Chemistry for Everyday Living in Society

Chemistry is a fundamental science that explains the composition, structure, and transformation of matter. It is deeply connected to daily human life and underpins many systems that support modern society. From food and medicine to energy and environmental protection, everyday chemistry is essential for survival, health, and development. According to GeeksforGeeks (2025), chemistry is considered the “central science” because it bridges physical and life sciences and explains many natural and human-made processes.

One of the most significant roles of chemistry in society is in healthcare and medicine. Many life-saving drugs, vaccines, and treatments are products of chemical research and development. For example, antibiotics such as penicillin are chemically derived compounds that fight bacterial infections (Testbook, 2025). Chemistry also supports medical diagnostics, including blood analysis, urine tests, and imaging techniques. Without chemistry, modern surgery, anesthesia, and disease treatment would not be possible. This shows that chemistry is essential for increasing life expectancy and improving public health.

Chemistry is important in ensuring that food is safe, nutritious, and available. Chemical

processes such as fermentation, cooking reactions, and food preservation improve taste, digestibility, and shelf life of food products (Chemistry Notes Info, 2023).

Preservatives like sodium nitrite and antioxidants prevent food spoilage, helping to reduce food waste and hunger. Chemistry also helps in understanding nutrients such as carbohydrates, proteins, fats, vitamins, and minerals, which are essential for human growth and energy production (SciArticle, 2024).

Agriculture depends heavily on chemistry for improving crop yield and soil quality. Fertilizers containing nitrogen, phosphorus, and potassium enhance plant growth and food production (Vedantu, 2025).

Pesticides and herbicides protect crops from pests and weeds, reducing losses and increasing agricultural productivity. Soil chemistry also helps farmers maintain soil fertility by balancing pH and nutrients. This makes chemistry crucial for feeding the growing global population.

Chemistry plays a key role in protecting the environment and controlling pollution. Water treatment processes such as chlorination and filtration ensure safe drinking water. Air pollution control technologies like catalytic converters reduce harmful gases released from vehicles (CLRN, 2025).

Chemistry also helps in recycling waste materials and developing biodegradable products that reduce environmental damage. Without environmental chemistry, pollution levels would increase significantly, threatening human and ecosystem health.

Modern industries rely on chemistry for the production of materials such as plastics, glass, cement, metals, and polymers. These materials are essential for construction, transportation, packaging, and electronics (GeeksforGeeks, 2025).

Chemistry is also important in developing semiconductors used in computers, smartphones, and digital devices. Industrial chemistry supports innovation, economic growth, and technological advancement in society.

Energy is essential for modern life, and chemistry is central to energy production and storage. Fossil fuels release energy through combustion reactions, while batteries generate electricity through electrochemical reactions.

Renewable energy technologies such as hydrogen fuel cells and solar panels also depend on chemical processes. According to CLRN (2025), chemistry is critical for developing cleaner and more efficient energy sources that reduce environmental pollution.

Chemistry is present in everyday household activities such as cleaning, cooking, and personal hygiene. Soaps and detergents remove dirt through emulsification, while disinfectants kill harmful microorganisms.

Even simple activities like baking involve chemical reactions, such as the release of carbon dioxide by baking soda, which makes dough rise. Toothpaste, shampoo, and cosmetics are all carefully formulated chemical products designed for human use and safety (ThoughtCo, 2019).

Recommendations

1. The government should provide adequately equipped chemistry laboratories in schools to improve practical learning and students' understanding of chemical concepts.
2. Qualified chemistry teachers should be employed and given regular training through workshops, seminars, and professional development programs to improve teaching effectiveness.
3. Educational authorities should increase funding for science education to provide modern instructional materials, chemicals, textbooks, and laboratory equipment.
4. Schools should integrate information and communication technology (ICT), such as virtual laboratories and multimedia tools, into chemistry teaching and learning.
5. The chemistry curriculum should be reviewed regularly to include practical applications, indigenous knowledge, environmental chemistry, and modern scientific developments.
6. Students should be encouraged to participate in science clubs, chemistry competitions, exhibitions, and research activities to increase their interest in chemistry.
7. Scholarships and incentives should be provided for students who study chemistry and other science-related courses in higher institutions.
8. Parents and communities should support science education by encouraging students to develop positive attitudes toward chemistry and scientific careers.
9. Public awareness programs should be organized to educate people on the importance of chemistry in national development, healthcare, agriculture, and industry.
10. Collaboration between schools, industries, universities, and scientific organizations should be strengthened to improve research, innovation, and practical applications of chemistry in society.

Conclusion

Chemistry is an essential aspect of everyday living and societal development. Its applications in agriculture, healthcare, food production, environmental management, and industrialization demonstrate its importance in improving human welfare. Traditional and modern chemistry are closely related and both contribute to scientific advancement and sustainable development. Indigenous knowledge of chemistry remains valuable in providing affordable, culturally relevant, and environmentally friendly solutions to societal problems. Promoting chemistry education, preserving indigenous knowledge, and encouraging responsible chemical practices will contribute significantly to sustainable development and improved quality of life.

Chemistry is essential to modern life and society. It improves food production, healthcare, agriculture, environmental protection, technology, and energy systems. By understanding its applications, humans can better utilize resources, improve quality of life, and solve global challenges such as pollution, disease, and food insecurity.

Everyday chemistry has a powerful social impact on modern society. It improves health, increases food security, supports education, protects the environment, strengthens economies, and advances technology. These contributions enhance quality of life and promote sustainable development. Understanding the social importance of chemistry helps societies make better decisions for health, safety, and long-term progress.

Traditional chemistry has played an important role in Nigerian society for centuries. Indigenous communities applied chemical knowledge in soap making, food preservation, medicine, metal works, pottery, brewing, textile production, and agriculture. These practices demonstrate that chemistry existed in Nigerian society long before formal scientific education.

Traditional chemical knowledge contributed to economic growth, healthcare, cultural preservation, and environmental sustainability. Although modernization has reduced some

indigenous practices, traditional chemistry remains valuable for scientific research and sustainable development.

Preserving and improving traditional chemical practices can help Nigeria achieve technological advancement while maintaining its cultural heritage.

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