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<https://doi.org/10.61796/jaide.v1i9.941>**RAW MATERIALS IN INDUSTRY AND ITS PROPERTIES****Olchinboyev Otabek**

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Abstract: This article provides detailed information about raw materials used in industry. In addition, the types, characteristics and classifications of industrial raw materials are presented. Feedback on improving and updating the properties of raw materials used in industry has been given.

Keywords: raw materials, industries, production, processing, artificial raw materials, minerals.

This is an open-access article under the [CC-BY 4.0](https://creativecommons.org/licenses/by/4.0/) license**Introduction**

Raw materials are the foundational inputs used in the production of goods and services across various industries. From metals and minerals to agricultural products and synthetic compounds, these materials undergo transformation into finished products that drive economic growth and innovation. Understanding the properties of raw materials is crucial for manufacturers, engineers, and researchers as they influence the production processes, cost-efficiency, and overall quality of the end products.

One of the elements involved in the production process of all Processing Industries is raw materials, since it is impossible to produce any products without raw materials. Raw materials are tools, equipment, materials and goods that are necessary for daily business activities [1]. Having quality raw materials is important for all enterprises. In the industrial sector, raw materials are one of the main components of production and processing processes. Raw materials are minerals and other natural resources from mines, products produced from them and requiring further processing. In a broad sense, raw materials refer to the subject of Labor, which has changed under the influence of Labor and must be further processed. In the process of production, a finished product or semi-factory from raw materials appears. The total of the raw materials is divided into industrial and agricultural raw materials according to their origin.

Methods

The research methodology employed in this study involves a comprehensive review of existing literature and data on raw materials across various industries. By analyzing published sources, including academic journals, industry reports, and relevant case studies, the research aims to identify the types, properties, and significance of raw materials in production processes. Additionally, qualitative analyses are conducted to assess the impact of raw material quality on production efficiency and product quality. This approach allows for a systematic understanding of how raw

materials contribute to industrial processes, as well as insights into sustainable practices and innovations within the sector. Overall, the study adopts a multidisciplinary perspective, integrating insights from materials science, engineering, and industrial economics to provide a holistic view of raw materials in manufacturing.

Result and Discussion

Industrial raw materials, in turn, are divided into mineral and artificial raw materials. According to its use, mineral raw materials are divided into fuel energy, metallurgy, mining, equipment, raw materials of the production of building materials, etc. Raw materials are natural resources that have not yet been processed, used in the production of industrial products [2]. Their quality and characteristics directly affect the efficiency of the production process and the quality of the final product. Raw materials are divided into the following main categories in the industry:

1. Mineral raw materials

This type of raw material is extracted from under the surface of the Earth. It includes:

- Metal ores: minerals such as iron, copper, diamonds.
- Energy resources: oil, natural gas, coal.

2. Agricultural raw materials

This type of raw material is grown in agriculture and used in industry. For example:

- Cereals: wheat, oats.
- Vegetable oils: cottonseed oil, soybean oil.

3. Natural raw materials

This category includes naturally occurring materials, for example:

- Wood: used in the construction and furniture industry.
- Salt: used in the chemical and food industries.

4. Artificial raw materials

This type of raw material is produced by chemical reactions. For example:

- Plastics: polyethylene, polypropylene.
- Synthetic fibers: Nylon, polyester. [3]

The industrial efficiency of raw materials depends on its physical and chemical properties. These features may include:

- The chemical composition of raw materials directly affects the quality of the product. For example, the metal content in Iron Ores is a determining factor in the quality of the oil.
- Physical properties of raw materials, such as density, melting point, strength, are significant in the production process. For example, the density and hardness of wood play an important role in furniture production. [4]

Raw materials can be broadly categorized into three main types:

1. Natural resources: These include minerals (like iron ore and bauxite), fossil fuels (coal, oil, and natural gas), and agricultural products (wheat, cotton, and timber). They are often extracted or harvested directly from the Earth.
2. Processed materials: These are derived from natural resources through various industrial processes. Examples include steel (from iron ore), plastics (from petrochemicals), and cement (from limestone).
3. Recycled materials: These are materials that have been reclaimed and processed to be reused in manufacturing. Common examples include recycled paper, metals, and plastics. [5]

Raw materials are unprocessed or minimally processed substances used in production. They can be classified into two main categories:

1. Biological materials: These include agricultural products such as cotton, wood, and foodstuffs. They are renewable and often sourced from nature.
2. Mineral and synthetic materials: These encompass metals like iron and aluminum, as well as non-metals such as silica and polymers. They are often extracted from the earth or synthesized through chemical processes. [6]

The properties of raw materials are crucial for determining their suitability for specific applications. Some of the key properties include:

1. Physical Properties:

- This affects transportation and structural applications. Heavier materials can provide strength, while lighter materials may be preferred for portability.
- These indicate thermal stability and influence processing methods. Metals, for instance, require specific temperatures for welding and casting.
- Essential for applications in electronics and energy transfer, materials with high conductivity (like copper) are critical in electrical industries.

2. Chemical Properties:

- This determines how materials interact with other substances, impacting safety and longevity. For example, metals can oxidize, while plastics may resist chemical degradation.
- Relevant in industries such as agriculture and food production, where the acidity or alkalinity can affect product quality and safety.

3. Mechanical Properties:

- The resistance of a material to being pulled apart is vital in construction and manufacturing. Steel, for example, has high tensile strength, making it ideal for structural applications.
- This property indicates a material's resistance to deformation and wear, important for tools and machinery.
- Ductile materials can be stretched into wires, while malleable materials can be shaped into sheets. These properties are essential in metalworking.

4. Aesthetic Properties:

- These properties influence consumer perception and are important in industries such as fashion and automotive design.[7]

Impurities in the composition of raw materials, such as the presence of solids or undesirable chemical compounds, can negatively affect the quality of the product. Therefore, manufacturers use various cleaning techniques to reduce pollution. Raw materials are the main foundation of the industry, and ensuring its quality contributes to the success of the production process. The following points indicate the importance of raw materials in industry:

- Quality and price: good quality raw materials contribute to the production of high quality products, which helps to regulate prices.
- Production efficiency: good quality raw materials simplify the production process and improve efficiency.
- Innovation and development: allows you to develop technologies for the production of new types of raw materials and create new products. [8]

Every raw material is a work item, but not every work item is a raw material. The workpiece turns into raw materials only after a certain degree of change with the means of Labor [9]. Underground minerals, wildlife, trees, etc. are potential natural resources rather than raw materials. Animals hunted using a means of Labor, mined mines, cut trees are raw materials. If it is processed in one or more stages during the production process, but cannot be consumed as a finished product, all three products, that is, called same firm. Raw material resources should be distinguished from raw materials. Raw material resources include mineral deposits, forest areas, pets and similar natural resources in the country, which can become raw materials only when they are mined or labor is spent on production.

Conclusion

Raw materials are important in the industry, the quality and characteristics of which determine the efficiency of the production process and the quality of the final product. Different types of district raw materials and their properties play an important role in improving production processes in the industrial sector, introducing new technologies and improving product quality. In order for industrial

production to be successful, it is necessary to correctly select and ensure the quality of raw materials. Raw materials are integral to the functioning of modern industries, serving as the basis for countless products and technologies. Understanding their properties not only aids in selecting the right materials for specific applications but also informs strategies for sustainability and innovation. As industries continue to evolve, the role of raw materials will remain crucial in shaping the future of manufacturing and technology. The challenge lies in balancing resource extraction with environmental stewardship to ensure a sustainable future for generations to come.

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