

Soap Noodles and Toilet Soap: Composition, Manufacturing, Quality Evaluation, And Industrial Significance

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ABSTRACT

Soap noodles are the primary intermediate raw material used in the manufacture of toilet soaps and bathing bars worldwide. Their uniform chemical composition, physical consistency, and controlled quality enable manufacturers to formulate soaps with desired cleansing efficiency, mildness, and aesthetic appeal. The toilet soap industry plays a crucial role in maintaining personal hygiene and public health while contributing significantly to the chemical and consumer goods sector. This journal paper presents a comprehensive review of soap noodles and toilet soaps, focusing on their raw materials, chemical composition, manufacturing processes, quality control parameters, finished product specifications, industrial applications, and environmental considerations. Emphasis is given to Total Fatty Matter (TFM), process standardization, and sustainability aspects relevant to modern soap manufacturing.

Keywords: Soap noodles, toilet soap, saponification, total fatty matter, quality control, soap manufacturing.

INTRODUCTION

Soaps are among the oldest chemical products used by humans for cleansing and personal hygiene. Traditionally, soaps were prepared by saponifying animal fats or vegetable oils with alkaline materials such as wood ash or lime. With the advancement of chemical engineering and industrial processing, soap manufacturing has evolved into a highly standardized and mechanized industry. One of the most significant developments in modern soap production is the introduction of soap noodles as a semi-finished raw material.

Soap noodles simplify the manufacturing process by eliminating the need for individual manufacturers to carry out complex saponification reactions. Instead, manufacturers can focus on formulation, refining, finishing, and branding of toilet soaps. Toilet soaps produced from soap noodles are specifically designed for skin application and are characterized by high purity, controlled alkalinity, pleasant fragrance, and cosmetic appeal. Increasing awareness of hygiene and personal care has further enhanced the demand for high-quality toilet soaps across global markets.

Soap Noodles: Composition and Characteristics

Soap noodles mainly consist of sodium salts of long-chain fatty acids derived from natural oils and fats such as palm oil, coconut oil, palm kernel oil, and tallow. The principal fatty acids present include lauric, myristic, palmitic, stearic, and oleic acids. In addition to fatty acid salts, soap noodles contain moisture, residual glycerol, and trace amounts of free alkali.

Total Fatty Matter (TFM) is the most important quality parameter of soap noodles. It represents the percentage of fatty substances present in the soap that actively contribute to cleansing action. Soap noodles with higher TFM values provide better lathering, improved cleansing efficiency, and reduced skin irritation. Physically, soap noodles are white to off-white in color, free-flowing in nature, and possess a neutral odor, making them suitable for further processing into toilet soaps.

Classification of Soap Noodles

Soap noodles are commercially classified based on their TFM content and intended application. Soap noodles containing approximately 60% TFM are generally used for laundry and multipurpose soaps. Soap noodles with around 72% TFM are commonly used for standard toilet soap production. High-grade soap noodles containing 80% TFM or more are utilized in premium and super-premium toilet soaps, offering superior mildness, rich lather, and enhanced consumer acceptance.

Raw Materials Used in Soap Manufacturing

The selection of raw materials plays a crucial role in determining the quality and performance of soap noodles and toilet soaps. Vegetable oils such as palm oil contribute hardness and durability to soap bars, while coconut oil and palm kernel oil improve foaming and lathering properties. Sodium hydroxide is the primary alkali used in soap manufacturing. During toilet soap formulation, additives such as fragrances, colorants, preservatives, chelating agents, and skin-conditioning agents are incorporated to enhance product functionality, stability, and aesthetic appeal.

Manufacturing Process of Soap Noodles

Soap noodles are manufactured using either the saponification process or the fatty acid neutralization process. In the saponification process, oils and fats react with sodium hydroxide to form soap and glycerol. The soap is separated, washed to remove impurities, dried under vacuum conditions, and extruded into noodle form. In the fatty acid neutralization process, fatty acids obtained from oil hydrolysis are neutralized with caustic soda, providing better control over soap color, odor, and consistency. Both processes aim to produce high-purity soap noodles suitable for toilet soap manufacturing.

Toilet Soap Manufacturing Process

Toilet soap production begins with the mixing of soap noodles and functional additives such as fragrances, colorants, preservatives, fillers, and moisturizers. The mixed soap mass is refined using roller refiners to achieve uniform texture and homogeneity. The refined material is then plodded into a continuous billet, cut into slugs, and stamped into soap bars of desired shape and size. The stamped bars are conditioned, dried, and packaged to ensure product quality and shelf life.

Quality Control and Finished Product Specifications

Quality control is essential to ensure the safety, performance, and consumer acceptance of toilet soaps. Important quality parameters include Total Fatty Matter, moisture content, free caustic alkali, pH value, hardness, and lathering ability. Finished bathing bars are also evaluated for fragrance retention, appearance, and skin compatibility. Compliance with standards such as **IS 2888: Toilet Soap Specification** ensures consistent product quality and regulatory approval.

Applications and Industrial Significance

Soap noodles are widely traded commodities that support decentralized soap manufacturing across the globe. They enable small- and medium-scale industries to produce toilet soaps without investing in complex saponification plants. Toilet soaps are essential consumer products used daily for personal hygiene, health protection, and cosmetic purposes. The soap industry contributes significantly to employment generation and supports agricultural economies associated with oilseed cultivation.

Environmental and Economic Considerations

Soaps are biodegradable and generally environmentally friendly compared to synthetic detergents. However, environmental concerns related to palm oil cultivation, such as deforestation and biodiversity loss, have led to the adoption of sustainable sourcing practices. Economically, soap manufacturing provides value addition,

recovery of valuable by-products such as glycerol, and opportunities for cost optimization through efficient resource utilization.

CONCLUSION

Soap noodles and toilet soaps form an integral part of the global personal care and hygiene industry. Soap noodles provide a standardized and flexible raw material base, while toilet soaps meet diverse consumer needs related to cleanliness and skincare. A thorough understanding of their composition, manufacturing processes, quality parameters, and environmental impacts is essential for sustainable industrial development. Continued innovation, quality improvement, and sustainable practices will shape the future of the soap manufacturing industry.

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