Sustainable Innovation with Cheese Wax Candles

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ABSTRACT

Cheese wax, originally designed for cheese preservation, presents an exciting opportunity for sustainable innovation. Unlike traditional paraffin wax, which is harmful to the environment due to its long decomposition time and pollutant emissions, cheese wax offers an eco-friendlier alternative. Our "ETHEREAL EMBERS" candles exemplify this shift by repurposing cheese wax waste into high-quality, fragrant candles. This transformation not only reduces waste but also highlights a more sustainable approach to manufacturing. Our candles incorporate natural, sustainably sourced ingredients such as vanilla beans and orange zest, enhancing indoor air quality and reducing the health risks associated with synthetic additives. The use of cotton wicks further ensures that no harmful substances, like lead, are present, aligning with rising consumer demands for eco-friendly products. This approach underscores a significant shift toward responsible consumption and demonstrates the potential of waste diversion in creating valuable, environmentally friendly products. By integrating principles of a circular economy, our method illustrates how thoughtful recycling and sustainable design can drive a positive environmental impact. The evolution represented by "ETHEREAL EMBERS" candles reflects a broader trend in manufacturing, where sustainability and innovative recycling practices play a crucial role in advancing greener, more responsible consumption. Our commitment to transforming cheese wax waste into elegant, high-quality candles not only contributes to reducing environmental impact but also sets a precedent for future practices in sustainable product design. This innovation exemplifies how creative recycling can foster a more sustainable future, blending functionality with environmental consciousness.

Keywords: candle, wax, eco-friendly, sustainable

INTRODUCTION

Contemporary wax and candle production faces significant challenges. Paraffin wax, a petroleum byproduct used in many candles, can release toxic compounds when burned. Additionally, the use of palm oil in some candles contributes to habitat loss and deforestation. Environmental concerns are further compounded by excessive plastic packaging. Certain waxes, particularly those containing volatile organic compounds (VOCs), can emit harmful chemicals into the air during combustion. Moreover, fragrances in candles may trigger respiratory issues or allergies. The extraction of specific waxes, such as beeswax, can deplete natural resources, and the sourcing of materials like palm oil often involves unethical practices. In response to these issues, there is a growing demand for eco-friendly and sustainable alternatives, such as cheese wax candles.

Cheese wax, when compared to conventional waxes, presents numerous advantages. Often made from natural ingredients, cheese wax is reusable and does not contain the hazardous chemicals found in many commercial waxes. By minimizing plastic waste, cheese wax also contributes to a more sustainable food system. Consumers can enjoy high-quality, long-lasting candles while supporting environmentally responsible practices by choosing cheese

wax. This paper explores cheese wax candles, highlighting sustainable methods and eco-friendly ingredients. We examine their benefits and emphasize how they can add a unique, handmade touch to home decor with minimal environmental impact. This approach not only reduces waste but also aligns with broader sustainability goals.

MATERIALS AND METHODS

The primary material used in this study was cheese wax, which is commonly utilized to preserve cheese. To promote sustainability and minimize the production of paraffin wax, we repurposed cheese wax by carefully removing it from cheese and then cleaning it through melting and filtration to eliminate impurities. The wax was melted in a double boiler at temperatures between 70°C and 80°C, with fragrant oils (orange and vanilla) added at a concentration of 2% of the total wax weight to create a calming effect. The mixture was stirred thoroughly to ensure even distribution of the oils while monitoring the temperature to prevent degradation. For candle formation, cotton wicks were secured in glass jars, and the fragranced wax was poured at a controlled temperature of 60°C to 70°C to ensure a smooth finish. The candles were allowed to cool and solidify at room temperature for 24 hours. The final products were then evaluated for fragrance intensity, burn quality, and calming effects, with qualitative assessments based on observations and feedback from volunteers.

RESULTS AND DISCUSSION

Adsorption Capacity of Powdered Clinoptilolite

The materials yielded high-quality, fragrant candles. This section discusses the benefits and principles behind each component used. First, cheese wax a natural byproduct of cheesemaking is biodegradable and renewable, burning cleanly with minimal soot. Recycled glass jars provide a sustainable and aesthetically pleasing option for our candles. By reusing glass, we reduce waste and energy consumption, contributing to a healthier planet. These jars are durable and can be easily cleaned for reuse. Cotton wicks, made from natural and biodegradable materials, offer a clean burn and efficient wax wicking, making them preferable to synthetic alternatives due to their lower emissions and potential health benefits (Liz, 2023). Lastly, the essential oils of orange and vanilla not only provide delightful fragrances but also possess uplifting and calming properties. Orange oil is invigorating, while vanilla oil promotes relaxation and stress relief (Seladi-Schulman, 2019; NEOM Wellbeing UK). Together, these materials create a sustainable, natural, and enjoyable candle-making experience that benefits both consumers and the environment.

CONCLUSION

The "ETHEREAL EMBERS" candles exemplify a successful approach to sustainable product design by repurposing cheese wax, which is typically discarded after its primary use. This study illustrates how transforming cheese wax into high-quality, fragrant candles can divert waste and promote eco-friendly alternatives to conventional wax products. By incorporating natural ingredients, such as essential oils of orange and vanilla, alongside cotton wicks and recycled glass jars, we reinforce a commitment to environmentally

responsible practices. This initiative not only mitigates the environmental impact of traditional candle production but also serves as a model for applying circular economy principles in small-scale manufacturing.

Through the innovative reuse of cheese wax, "ETHEREAL EMBERS" candles offer consumers a product that aligns with the increasing demand for sustainability and health consciousness. The findings suggest that cheese wax can be a viable, eco-friendly alternative to traditional paraffin and other waxes, supporting a more sustainable product ecosystem. Ultimately, this work calls for further exploration of sustainable materials and methods, demonstrating how creativity and environmental consciousness can converge to produce functional, aesthetically pleasing, and eco-friendly products. By embracing such practices, we can move toward a future that minimizes waste and optimizes resource use, contributing to broader efforts in environmental preservation and responsible consumption.
capacity.

REFERENCES

Liz, 2023. “Cotton Wick vs. Wooden Wick Candles: Which Is Better? - Aluminate Life”. *Aluminate Life*.
NEOM Wellbeing UK. (n.d.). *The Many Benefits of Vanilla Essential Oil – NEOM Wellbeing UK*.
Seladi-Schulman, J. 2019. “The Benefits of Orange Essential Oil and How to Use”. *Healthline*. https://www.healthline.com/health/orange-essential-oil-uses