

Advancing the Circular Economy through Delamination Solutions for Multilayer Aluminum Packaging

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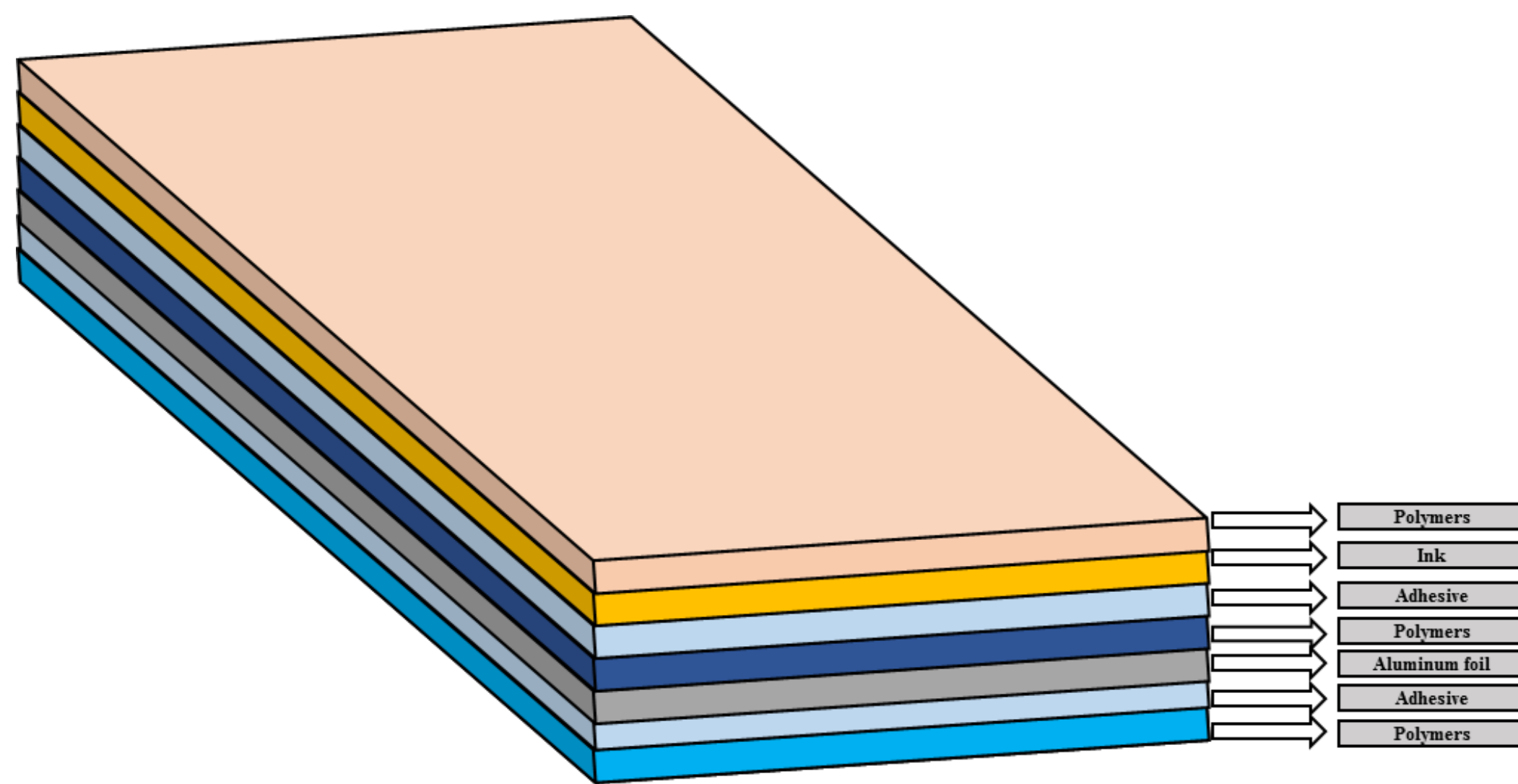


Fig. 1 Multilayer aluminum packaging structure

Introduction

In the context of sustainable development, the circular economy offers a vital solution to the mounting challenges of resource depletion and environmental degradation, particularly evident in the packaging industry. Multilayer aluminum packaging, crucial for food preservation, presents significant recycling hurdles due to its complex composition (Figure 1). This review explores delamination solutions as a means to address these challenges and advance circular economy principles within the packaging domain.

Objective

This study aims to delve into delamination techniques for multilayer aluminum packaging, dissecting these materials into recyclable components to align packaging practices with circular economy principles. The focus is on mitigating waste, reducing environmental impact, and fostering sustainable material management.

Methodology

The research evaluates the effectiveness of chemical delamination processes for separating aluminum from other layers in multilayer packaging. Phases include sample collection and preparation, identification and selection of chemical agents, delamination process testing, optimization of process parameters, environmental impact assessment, and scalability and industrial applicability analysis.

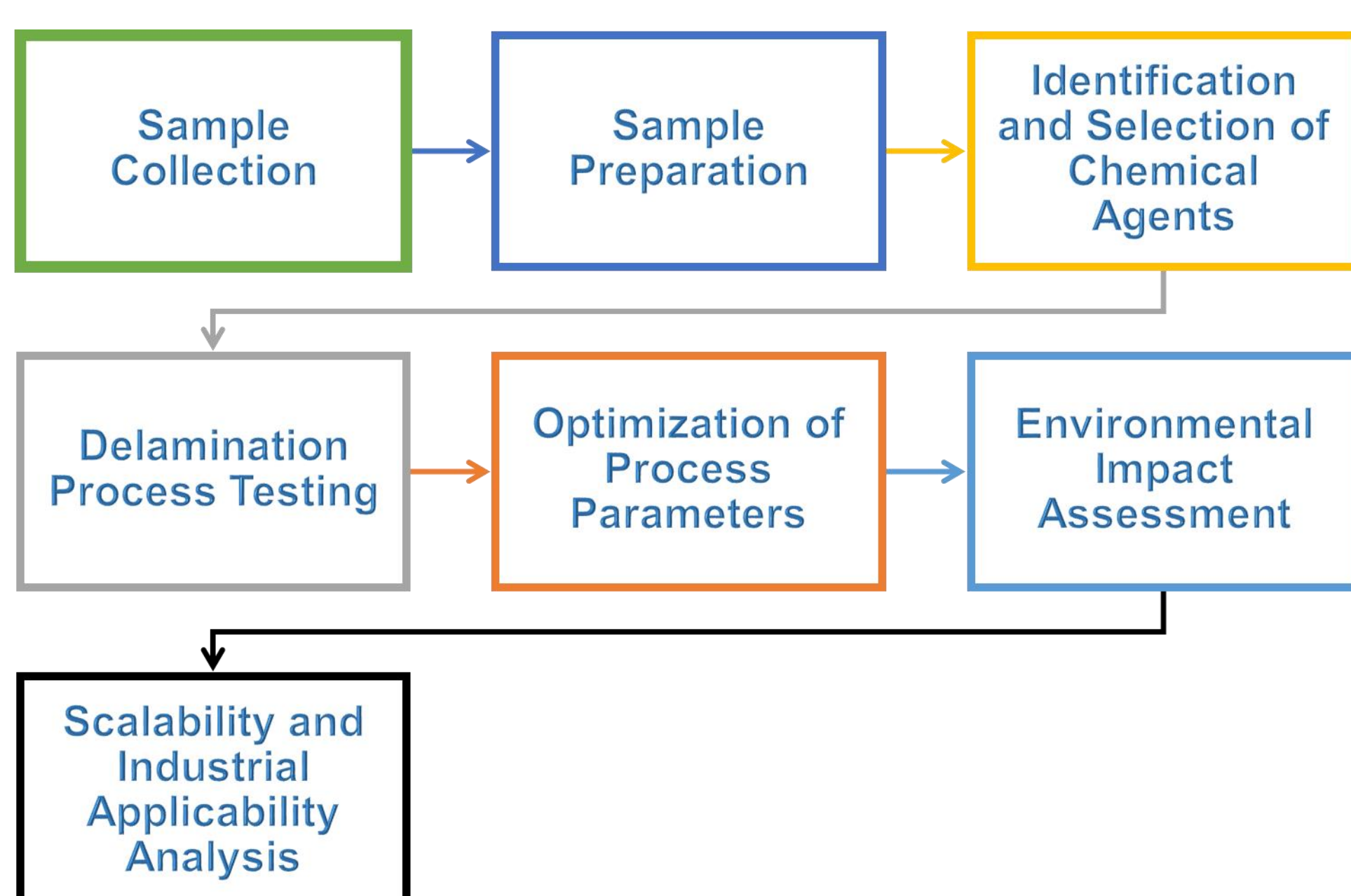


Fig. 3 A flowchart outlines the different phases of the research.

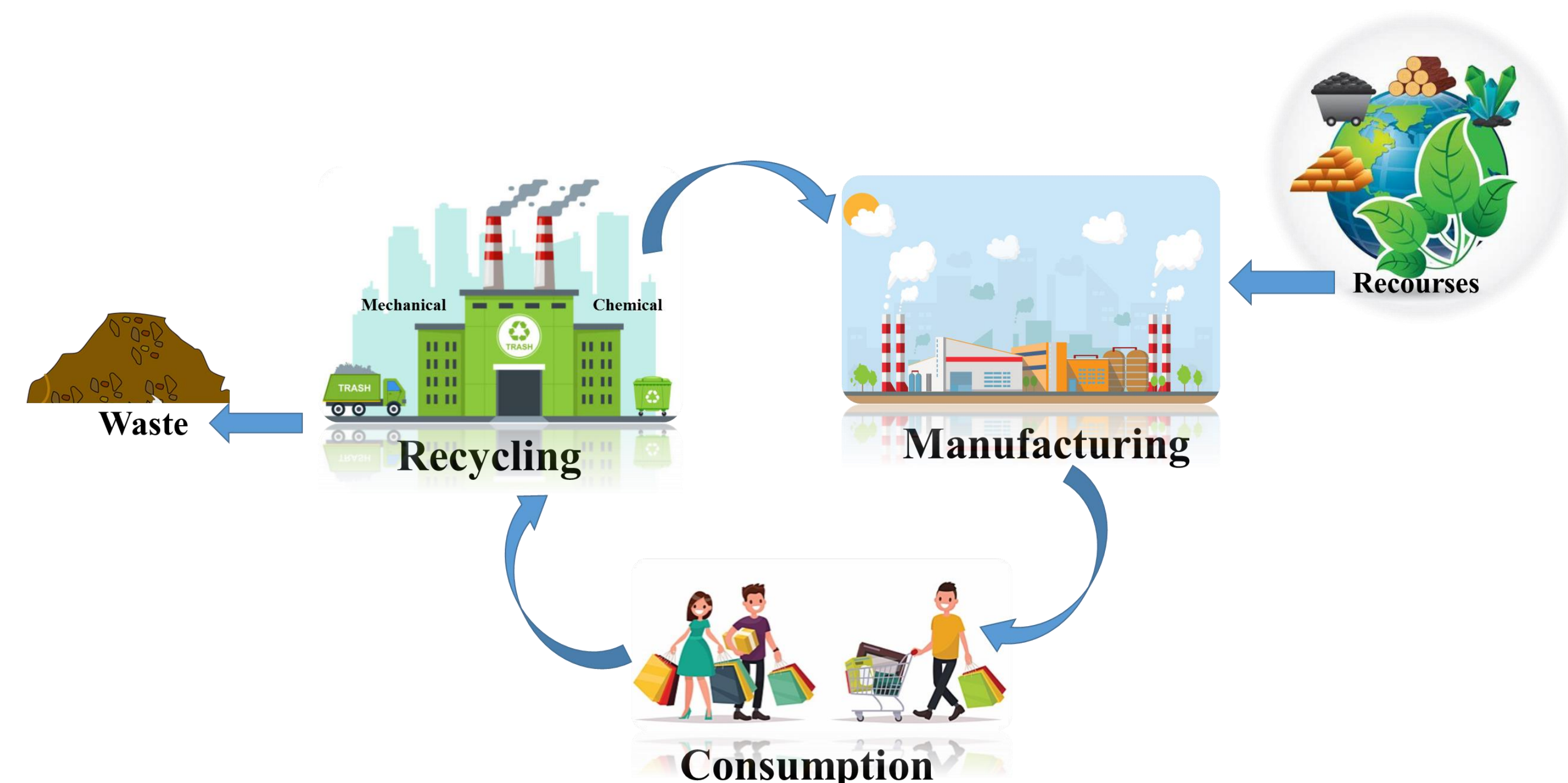


Fig. 2 Circular Economy Flow Diagram

Results and Discussion

The study identifies a specific chemical agent demonstrating high efficiency in delaminating aluminum from plastic layers, achieving over 90% delamination efficiency with minimal damage to the aluminum layer. The process proves cost-effective and environmentally friendly, showcasing its potential to significantly improve the recyclability of multilayer aluminum packaging.

Conclusion

Chemical delamination represents a transformative advancement in overcoming recycling challenges associated with multilayer aluminum packaging, contributing to more sustainable packaging practices and supporting the circular economy's objectives. This progress underscores the importance of innovation in promoting environmental sustainability within the packaging industry.

Funding

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