

ALOE ECELL: A STUDY ON USING ALOE VERA IN ECO-FRIENDLY BATTERIES

Ms. Manasi Shah, Mr. Bagavath Raaju Perumal Konar

SIES College of Commerce and Economics (Autonomous)

bagavath017@gmail.com

ABSTRACT:

"Going Green with Aloe Vera Batteries: A Sustainable Solution for Our Energy Needs?"

E-waste is the fastest-growing waste in the twenty-first century. Dry cell batteries are quickly filling landfills. This small dead battery causes toxic heavy metals to leach into ground water, soil, and the surface, causing pollution. It also has the potential to cause leaching into agricultural fields. As a result, a multifaceted problem arises. Aloe Vera batteries have been identified as a promising solution to the dangers posed by disposable dry cells. This research paper aims to know whether people are aware of the chemicals used in traditional batteries, and their acceptance of Aloe Vera as a material for battery production, with a focus on its environmental impact and potential to replace synthetic materials. This paper discusses Aloe Vera batteries and highlights their potential benefits, but also mentions some challenges that need to be overcome.

Keywords: eco-friendly batteries, Aloe Vera, renewable energy, biodegradable, Aloe Ecell

INTRODUCTION:

Aloe Vera is a widely available and renewable plant that has gained attention for its potential use in battery production due to its ability to absorb sunlight and withstand harsh conditions, making it a good source of electrical energy. While Aloe vera batteries are still in the early stages of development and are not yet able to generate a lot of electrical energy, research is being conducted to explore their potential as a sustainable and biodegradable alternative to traditional batteries. Using Aloe Vera in battery production has several advantages, including being a renewable resource and potentially being cheaper to produce than traditional batteries, making it an exciting prospect for a more sustainable future.

Aloe-Ecell is a startup that has been at the forefront of this effort, researching the potential use of Aloe Vera as a sustainable and biodegradable material in battery production. Aloe Vera is a widely available and renewable plant known for its medicinal and skin care properties, and it has gained attention in recent years as a potential eco-friendly alternative to traditional battery materials due to its high electrochemical stability and biocompatibility.

LITERATURE REVIEW:

Batteries account for 80% of all e-waste. Every year, nearly 89 billion batteries are consumed, a majority of which end up in land-fills due to improper disposal **Vilnius (2021)**. Batteries have the potential to leach toxic heavy metals into the surrounding soil, surface and groundwater **Mahesh and Mukherjee(2019)**. Using easy methods, electrical energy can be generated from Aloe Vera plant **Souder and Deepa(2022)**. The gel found in Aloe Vera leaves has electrical properties and can generate a small amount of electricity, bringing a new revolution to eco-friendly electrical products **Arvind Kumar et.al (2014)**. The substitution of less toxic metals (Mn) for toxic metals (Co and Ni) may improve the

environmental compatibility and sustainability of the next generation of lithium battery materials **Wojciech Mrozik et.al (2021)**. It is demonstrated that Aloe Vera plants can be used as an energy source to provide electrical energy, and that when combined with the proposed power management circuit, they can function as a plant base cell. An Aloe Vera extract can produce stable voltage and current with Cu-Zn electrodes. Low power consumption devices can be powered using plant base cell (PBC) **Lean Chong et.al (2019)**. Aloe ecell can power low-power devices such as cameras, clocks, and remote controls. India spends 149 billion dollars in acquiring raw materials for dry cells as 97% of the raw material is outsourced. Aloe Vera batteries reduce this load by reducing the outsourcing burden as Aloe Vera can be easily produced in India **Parvathi JR (2021)**. The production costs of Aloe-Ecells are 10% lower, their batteries last 50% more time than conventional dry cell equivalents **Fino menzes (2021)**. The "electro herbal cell," a new battery design made from natural ingredients, was introduced. **Varma and Suman (2021)** Aloe Ecell is part of the Aloe biofuel ecosystem, which aims to bring biofuel-enhanced batteries to the blockchain **Harshita Duggal (2022)**. Aloe ecell is a pilot initiative that includes a collection mechanism as well as an environmentally friendly process of recycling, repurposing, and tracing the supply chain **Naveen Suman (2019)**.

OBJECTIVE:

- To study the awareness of harmful effects of chemical batteries among users.
- To study the perception of dry cell battery users towards Aloe Vera batteries.
- To study the readiness of dry cell battery users to switch to Aloe Vera batteries.

RESEARCH METHODOLOGY:

Descriptive research design was used for the purpose of this study. A total of 112 respondents from Mumbai were surveyed using an online questionnaire and their responses were recorded and analysed using descriptive statistics. Convenience sampling was used for the purpose of research.

Secondary data was collected using various articles, research papers and blogs in newspapers, journals and websites.

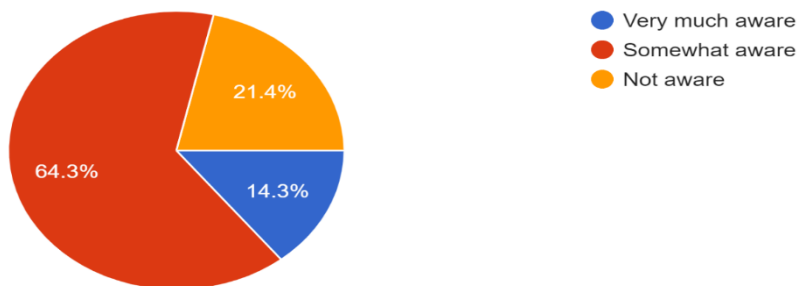
DATA ANALYSIS:

Interpretation:

According to the analysis, a significant majority of individuals, specifically 81.3%, utilize Eveready batteries.

How much aware are you of the chemicals used in batteries ?

112 responses

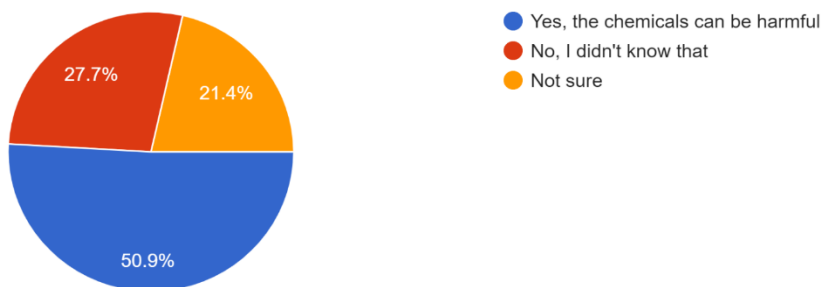


Interpretation:

Awareness about the use of chemicals used in batteries is high.

Are you aware that the chemicals used in batteries can potentially harm both the environment and human health?"

112 responses

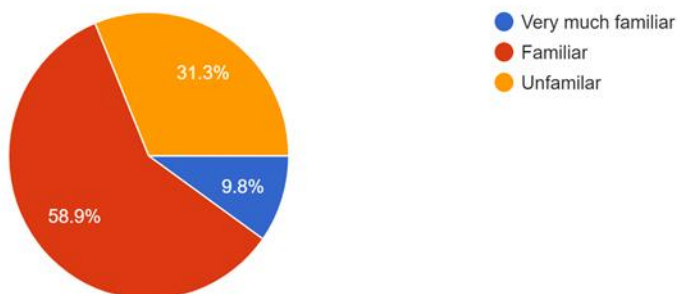


Interpretation:

50% of the people are highly aware about the chemicals used in batteries can harmful to human health and environment.

How familiar with the concept of using Alovera in batteries

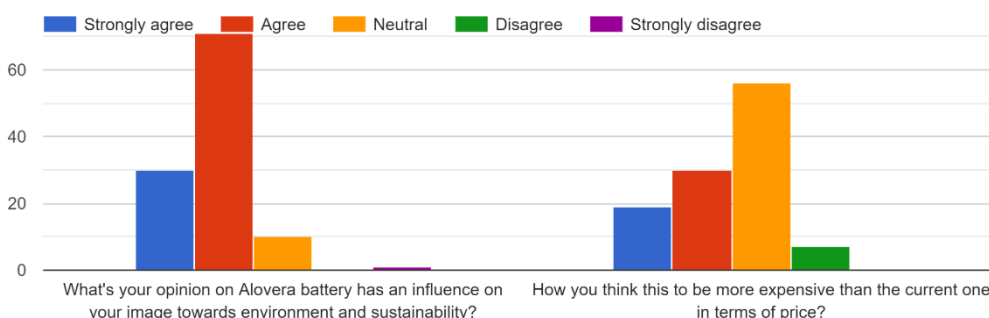
112 responses



Interpretation:

Majority of the people are familiar with the concept of using Aloe Vera as a material in batteries.

Questions...

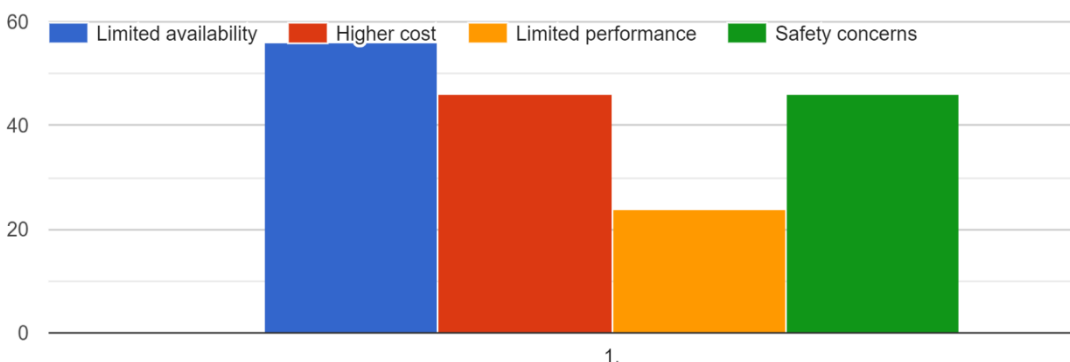


Interpretation:

Majority of the people agree that Aloe Vera batteries have an influence on their image towards environment and sustainability.

Majority of people hold the perception that Aloe Vera batteries are more expensive than the chemicals batteries.

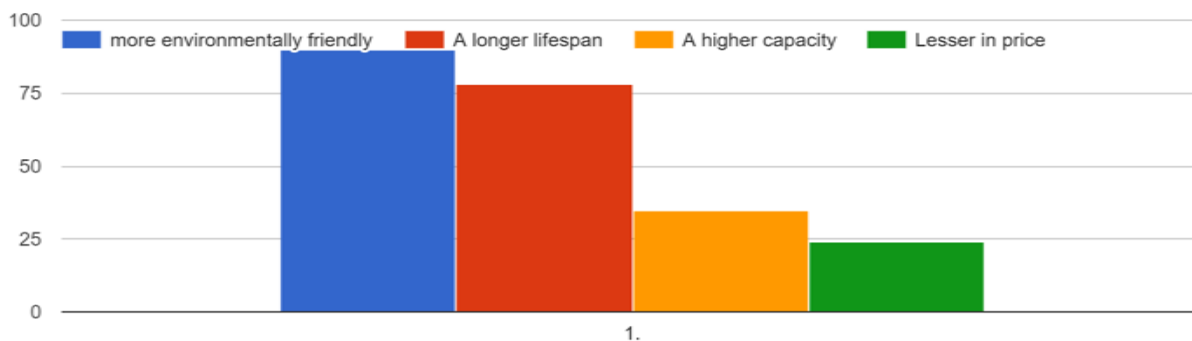
What challenges you see while buying Alovera batteries over traditional (chemical) batteries



Interpretation:

Majority of people encounter certain challenges such as Limited availability and higher costs while considering Aloe Vera batteries over Chemical batteries.

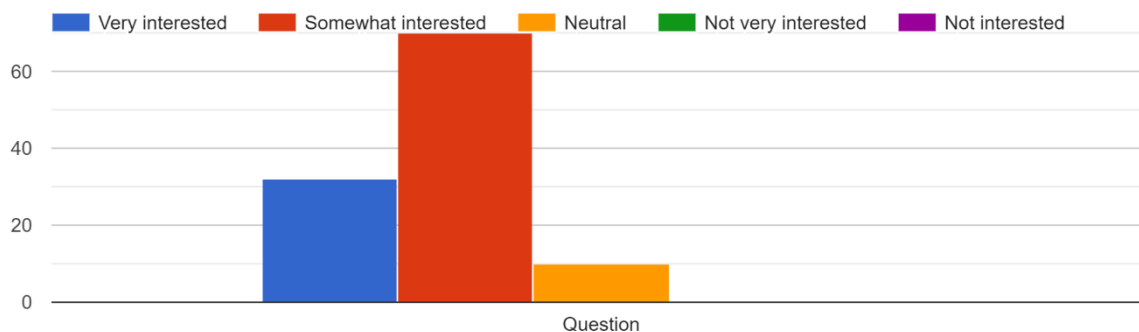
What factor encourages you to consider buying Alovera batteries?



Interpretation:

Environmental friendliness and long life span were the two prominent factors that would encourage people to consider Aloe Vera batteries.

How interested are you in using Aloe Vera batteries in the future?

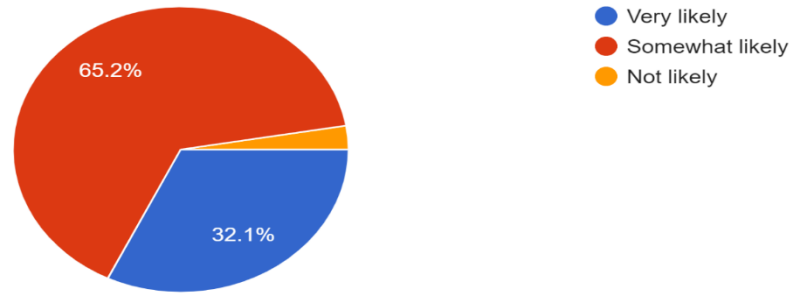


Interpretation:

Majority of the people are interested in using Aloe Vera batteries in future.

How likely are you to recommend AloeVera batteries to your friends and families?

112 responses



Interpretation:

The Majority of people are more likely to recommend Aloe Vera batteries to there friends and family.

KEY FINDINGS:

- The majority of people are highly knowledgeable about the chemicals used in batteries that are harmful to humans and the environment.
- Aloe Vera can be used as a natural electrolyte in batteries, replacing traditional electrolytes like Alkaline chemical, which is harmful to the environment.
- Aloe Ecell batteries are non-toxic, non-explosive, and environmentally friendly, making them a safer alternative to traditional batteries.
- Aloe Ecell batteries show great potential for use in portable electronic devices like Remote , Clocks etc
- Aloe Vera-based batteries are perceived to be more expensive than traditional batteries.
- Aloe Vera batteries are perceived to be environmentally friendly and therefore, this perception is positively influencing the willingness of people to try it as an alternative to dry cell batteries.

RECOMMENDATIONS:

1. Increasing the availability of Aloe Vera batteries by making them more widely available in stores and online.
2. Providing more information and education about the safety of Aloe Vera batteries to address any concerns people may have.
3. Encouraging people to consider the environmental impact of their battery choices and to consider switching to more sustainable options like Aloe Vera batteries. By creating a marketing campaign on social media.
4. Sharing pricing information about Aloe Vera batteries through advertising and social media can help people understand that these batteries are more affordable than regular options.

LIMITATIONS AND SCOPE OF FURTHER RESEARCH:

This study was conducted only on residents from Mumbai and with only 112 respondents. A larger sample needs to be studied to understand the readiness of consumers to switch. The respondents of this study may lack the knowledge necessary to make a switch and therefore, the results may be different if a larger sample is studied. The studies on the awareness and acceptance of Aloe Vera as an alternative to chemical batteries, from consumer and market perspective are very limited. More studies need to be conducted to study the readiness of dry cell battery consumers to switch to Aloe Vera batteries. Also, more studies can be conducted to know the awareness levels of consumers about the harmful effects of chemical batteries used.

CONCLUSION:

Aloe Vera is being explored as a potential material for eco-friendly batteries because it is biocompatible and has high electrochemical stability. Some studies have found that using Aloe Vera extract as an electrolyte in zinc-carbon batteries can improve discharge capacity and lifespan compared to traditional electrolytes. Aloe Vera leaves have also been found to produce electricity in energy harvesting systems. While Aloe Vera batteries have potential environmental benefits and a longer lifespan, they face challenges such as limited availability, higher cost, and safety concerns. Aloe Ecell, a company that produces eco-friendly products like Aloe Vera batteries and recycled battery fertilizers, is working on a pilot initiative to collect and trace the supply chain of batteries to make recycling more viable and economical. The Aloe Token is a cryptocurrency used by Aloe Ecell that rewards collectors and depositors of batteries and offers discounts on Aloe products. The Aloe Token is part of the Aloe Ecell ecosystem, which uses blockchain technology for battery distribution and collection to address electronic waste. The price of Aloe Ecell batteries is higher than traditional batteries in the perception of people, but the estimated price in India is lower, at around Rs 9-10 per unit.

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AloeVera