Investigating Barrier Properties of Laminate Packaging Materials for Flexible Batteries
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Introduction
Flexible batteries are used in wearables such as health monitoring devices, skin sensors, and flexible electronics.
These batteries are made with sealed flexible packaging material which undergo constant bending.

https://www.powerstream.com/thin-lithium-ion.htm

Research Questions
What is the effect of grain orientation of the seal strength?
What is the effect of the adhesive, tab, and electrolyte exposure on the seal strength?
How does the seal strength change after bending?

Analyzed Material
Name: A
Thickness: 0.148 mm

Name: B
Thickness: 0.087 mm

Methods
1. Cut the samples into the desired dimensions

2. Prepared two adhesive tapes and the tab

3. Sealed samples

Adhesives were added between the sealing area to secure the tab used for electrical connections to the battery electrodes.

4. Bending machine or electrolyte addition

Angle: 60° Cycles: 3,000

Sealing Area
Sample dimensions:
A: 5 cm x 4 cm
B: 2.5 or 3 cm x 4 cm

Bending Axis
Cross-section view

Conclusion
HH had the highest seal strength in both Material A and B. Material A’s seal strength decreased when adding adhesive + tab. It also decreased slightly with bending but decreased the most with electrolyte addition. Similar trend occurred in Material B except the seal strength increased in bending. Material B’s seal strength is higher in all conditions when compared to Material A.

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