



GEL ELECTROLYTE FOR EEG HEADSETS

ID# 2026-066

HIGHLIGHTS

- Utilizes a novel hydrogel for better electrode-to-scalp contact.
- Features a "booger glue-like" texture for superior grip.
- Enables prolonged signal acquisition without drying out.
- Eliminates common safety issues found in current market standards.

OPPORTUNITY

Current brain signal measurement technologies are often limited by the trade-off between adhesive strength and user comfort. Standard adhesives like Collodion are flammable and require harsh chemicals for removal, while typical gel electrolytes dry out within hours. University of Alberta and University of Calgary researchers have developed an adhesive, conductive gel specifically for full-day EEG monitoring. Unlike traditional collodion or lotion-based gels, this solution offers:

- **Prolonged Use:** Sustains high-quality electrical connection for a full day with a mitigated drying-up problem
- **Improved Safety:** Non-flammable and free of the harsh chemical odors (e.g., ethyl ether) found in standard adhesives.
- **Superior Adhesion:** Designed to allow vigorous motion by the wearer without loss of signal.
- **Easy Removal:** Can be removed easily using common oil-based products like dry hair conditioner, avoiding skin-irritating solvents like acetone.
- **Unique Storage:** The material can be dried and ground into powder form for convenient storage and transportation, then rehydrated for topical application.

The charge-imbalanced polyampholyte gel was subjected to comprehensive chemical, mechanical, and adhesion testing. These tests confirmed that the gel establishes a safe, residue-free, and pressure-sensitive connection to the scalp. Notably, comparative EEG trials demonstrated that the gel, even after being rehydrated from a dried powder, delivers superior signal quality compared to standard commercial conductive hydrogels across a wide range of frequencies.



COMPETITIVE ADVANTAGE

- **Higher Signal Quality:** Preliminary results show improved EEG quality indices in SSAS (1-50Hz), SASS (60Hz), and RMS categories compared to commercial conductive hydrogels.
- **Optimal Mechanical Properties:** Featuring an elastic modulus (10-30 Pa) that balances structural integrity with the flexibility to conform to various headset holders and scalp surfaces.
- **Skin-Friendly:** Dialysis processing ensures minimum residual monomers, contributing to overall safety for human use.

IP STATUS

- Patent pending

INVENTOR

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MORE INFORMATION

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