

TECH OFFER

Cost-Effective And Non-Toxic Conductive Ink For Various Electronic Applications



KEY INFORMATION

TECHNOLOGY CATEGORY:

Electronics - Printed Electronics

Materials - Semiconductors

TECHNOLOGY READINESS LEVEL (TRL): **TRL4**

COUNTRY: **SINGAPORE**

ID NUMBER: **TO175064**

OVERVIEW

Conductive ink, a functional ink that can conduct electricity, has emerged as an innovative and promising approach to revolutionise the manufacturing processes of electronics industry. There has been a rising enthusiasm for novel technologies dedicated to producing conductive inks, drawing growing interest from both the academic and industrial sectors. Compared to conventional silicon-based electronic devices that are more expensive and difficult to produce, these conductive inks empower the creation of printed electronic devices, offering notable advantages such as high flexibility, customisability, and cost-effectiveness.

The technology owner has developed a simple synthesis process to fabricate conductive ink that exhibits excellent electrical performance. The as-synthesised conductive ink has been formulated to achieve a remarkable low resistance value, ranging from 557.4 Ω to 0.80 k Ω . As resistance is the inverse of conductivity, the low resistance value endows such conductive ink with excellent electrical conductivity even on a non-conductive paper substrate. Beyond functionality, such conductive ink is non-toxic, waterproof, and inherently economical, making it a cost-effective and sustainable solution.

The technology owner is seeking co-development, out-licensing and test-bedding opportunities with industrial partners to deploy such conductive ink in various applications, i.e., printed electronics, semiconductors, sensors, energy storage, STEM educational tools, etc.

TECHNOLOGY FEATURES & SPECIFICATIONS

Some features of this technology are:

- Simple synthesis process eliminating the need for costly or complex equipment
- Cost-effective conductive ink requiring minimal reagents
- Excellent electrical conductivity
- Lightweight and waterproof
- Applicable for coating on non-conductive substrates (i.e., paper) and yet maintaining excellent electrical conductivity
- Superior adhesion to 3D-printed substrates
- Non-toxic and environmentally friendly

POTENTIAL APPLICATIONS

- Energy storage applications (i.e., lithium-ion batteries (LIB))
- Sensor applications
- Printed electronics (i.e., 3D printing, RFID tags)
- Flexible and stretchable electronics (i.e., smart wearable)
- Circuit prototyping
- Automotive applications (i.e., heated windshields for ice melting)
- Educational tools for STEM (i.e., teaching electronics / circuitry concepts in educational settings)
- Art and design applications (i.e., interactive and electronic artworks for artists and designers)

UNIQUE VALUE PROPOSITION

- **Excellent performance:** high electrical conductivity and low resistance value
- **Cost-effective method:** simple synthesis process without complex equipment
- **Sustainable solution:** non-toxic, lightweight, and waterproof