# Environmentally friendly water-based conductive inks

**CSIC has developed conductive water-based carbon inks and pastes. These inks/pastes are free of metals and toxic solvents. They are suitable to be processed by different types of large-area film processing technologies into conductive films in an environmentally friendly way. The resulting conductive films are useful for the sustainable production of electrical components and electronic devices.**

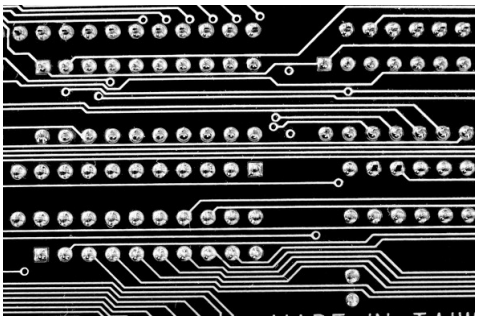
**Industrial partners from the chemical or electronic sector are being sought to collaborate through a patent licence agreement.**

***An offer for Patent Licensing***

## Tailored consistency and conductivity

Due to their exceptional conductive properties, carbon nanomaterials are a preferred alternative to replace metals in conductive inks. However, inks filled with carbon nanostructures are usually based on toxic and contaminating organic solvents or surfactants, posing serious health and environmental risks.

Researchers of CSIC have developed conductive inks based on carbon nanomaterials dispersed in aqueous medium by using a non-toxic and environmentally friendly dispersant. After short hydrothermal processing of the components, conductive inks with tailored consistency are obtained. These inks can be subsequently processed by a wide range of techniques into homogeneous conductive films. The resulting films exhibit electrical conductivity between $10^4$ and $10^5$ S / m.



The inks can be used for the sustainable production of electrical components and electronic devices

## Main innovation and advantages

- A simple and scalable production process that yields conductive water-based carbon inks with tailored consistency.
- Ink processing by a wide range of techniques such as spray coating, roll-coating, roll-2-roll-coating and serigraphy, resulting in homogeneous conductive films.
- Deposition onto different types of substrates such as glass, glass coated with semiconducting metal oxides, plastics (PET) and semiconducting metal oxides, offering excellent adhesion.
- Layer-by-layer ink processing onto the substrate achieving a precise control of the thickness of the film as a function of the applied processing technique.
- The films produced from these inks exhibit high thermal resistance, up to 400°C preserving their mechanical integrity.
- High resistance of the films to organic solvents such as NMP, DMSO, acetonitrile, etc., preserving their mechanical and chemical stability.

## Patent Status

Priority patent application filed suitable for international extension.

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