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PhD. thesis (2025-2028)
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Eco-design of optically active multi-layered systems by full printed approach: materials-process correlations

Eco-conception de systèmes multicouches optiquement actifs par approche totalement imprimée : corrélations matériaux-procédés

FunPrint
MatBio

Context

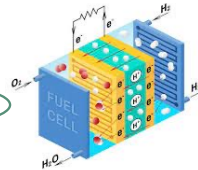
Electrochromic devices

Smart windows
Planes, cars, buildings



Flexible displays
Solar cells, captors

Other technologies
Fuel cells, printed battery



Printing technologies advantages

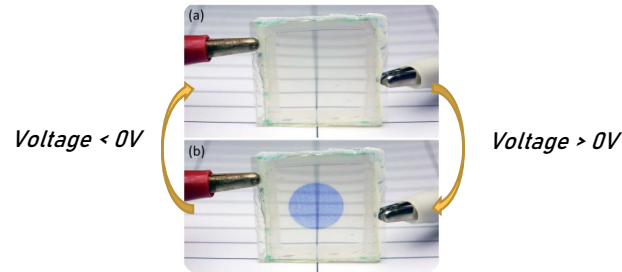
- Low production's cost
- Eco-friendly components
- Large deposition surfaces
- Flexible surfaces

Funded by / in collaboration with:



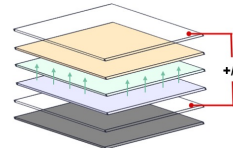
Objectives

Create a device which can change their color when a electrical voltage is applied (reversible action)



- Good optical properties
- Durability after several cycles of use
- Electrical and thermal stability
- Low switching time between the two state

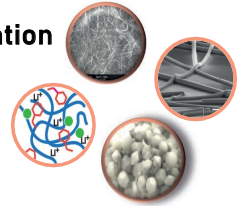
Study the interface phenomena



Methods

Nano particles characterization

- Cellulose
- Silver nanowires
- Electrolyte
- Metallic oxide particles



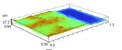
Fluid engineering

- Electrochromic ink
- Electrolyte ink
- Transparent conductive ink



Printing processability

- Rheological properties
- Characterization of unique layers



Materials physics

- Experimental and modelling approaches
- Stability assessment under stress

