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# Memristif element and electronic memory based on such element

**Notre référence :**  
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## Status des brevets

FR1004931: Priority patent of invention filed on December 17, 2010 entitled: "Elément memristif et mémoire électronique basée sur de tels éléments."



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## Status Commercial

Research agreement, exclusive or non exclusive licenses

## Laboratoires

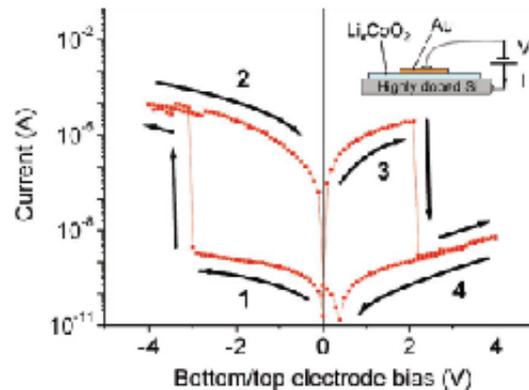
## TECHNICAL DESCRIPTION

Recent work done on type materials  $\text{Li}_x\text{CoO}_2$  helped highlight a resistive reversible switching of a sandwich consisting of a degenerate semiconductor electrode, a thin layer of material and metallic counter electrode.

The reversibility of the red/ox process can be considered very reliable and speeds fast switching.

The material is commonly used in the battery industry and therefore easily integrated into a conventional manufacturing process. The analysis shows that the nature of the electrodes used does not affect the physical processes involved.

Ongoing experiments will complete the technical specification of the structure.



Resistive switching of the structure electrode1/ $\text{Li}_x\text{CoO}_2$ /electrode2 ( $100 \times 400 \mu\text{m}^2$ )  
Between a low resistance level  $R_{\text{low}}$  and a high state  $R_{\text{high}}$ ,  
With  $R_{\text{high}} / R_{\text{low}} > 10^4$

## BENEFITS

Using this type of structure whose switching is very fast, reversible and the method of manufacture now well controlled, allow the production of high-density non-volatile memories integrable in the manufacture of microelectronic components.

## INDUSTRIAL APPLICATIONS

The main application field of this type of compound is in the manufacture of integrated circuits and more particularly in the field of rapid and non-volatile memories, and also in complex circuits using memories buffers. (FPGAs, microprocessors...).

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**Mots clés :**

Electrochemical  
memory Re-RAM