



Hybrid Resistive Memory Elements: Fundamental Considerations and Emerging Device Applications

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■ Electrically tunable resistors realized in two terminal structures seem to be one of the most versatile innovations in the semiconductor industry with many possible applications such as logic circuitry or neuromorphic systems. In particular, inorganic resistive switching devices utilized as non-volatile memory are close to commercialization. Also, resistive switching effects in organic and hybrid devices have been presented in a multitude of devices and novel materials. [1] Recently the fabrication of organic resistive switches using environmentally friendly inkjet-printing methods and their integration into fully functional hybrid crossbar array structures has been demonstrated. [2]

[1] S. Nau, C. Wolf, K. Popovic, A. Blümel, F. Santoni, A. Gagliardi, A di Carlo, S. Sax, E. J. W. List-Kratochvil, "Inkjet-printed Resistive Switching Memory based on Organic Dielectric Materials: From Single Elements to Array Technology", *Adv. Electr. Mater.*, **1**, 1400003 (2015)

[2] S. Nau, C. Wolf, S. Sax, E. J. W. List-Kratochvil, "Organic Non-Volatile Resistive Photo-Switches for Flexible Image Detector Arrays", *Adv. Mater.* **27**, 1048 (2015), also featured in *Nat. Mater.*, **14**, 134, (2015)