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Nonvolatile flexible organic bistable devices fabricated utilizing CdSe/ZnS nanoparticles embedded in a conducting poly *N*-vinylcarbazole polymer layer

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The bistable effects of CdSe/ZnS nanoparticles embedded in a conducting poly N-vinylcarbazole (PVK) polymer layer by using flexible poly-vinylidene difluoride (PVDF) and polyethylene terephthalate (PET) substrates were investigated. Transmission electron microscopy (TEM) images revealed that CdSe/ZnS nanoparticles were formed inside the PVK polymer layer. Current-voltage (*I-V*) measurement on the Al/[CdSe/ZnS nanoparticles + PVK]/ITO/PVDF and Al/[CdSe/ZnS nanoparticles + PVK]/ITO/PET structures at 300 K showed a nonvolatile electrical bistability behaviorwith a flat-band voltage shift due to the existence of the CdSe/ZnS nanoparticles, indicativie of trapping, storing, and emission of charges in the electronic states of the CdSe nanoparticles. A bistable behavior for the fabricated organic bistable device (OBD) structures is described on the basis of the *I-V* results. These results indicate that OBDs fabricated by embedding inorganic CdSe/ZnS nanoparticles in conducting polymer matrix on flexible substrates are prospecting for potential applications in flexible nonvolatile flash memory devices.