Highly stable OTFT-NVMs with hydroxyl group charge trapping layer via iCVD dielectric

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With the development of wearable devices. Organic flash memory gets great attention because it is suitable for wearable devices. However, OTFT-NVMs have high operation voltage and data stability problems caused by thick insulation layer. This study introduced iCVD dielectric for the solution. Tunneling layer is poly(1,3,5-trimethyl-1,3,5-trivinyl cyclotrisiloxane) (pV3D3) and blocking dielectric is poly(1,4-butanediol diacrylate) (pBDDA), with excellent insulation properties (E_{break} > 8 MV/cm with its thickness of 21.3 nm). For long-term memory operation A 6-nm thick ultrathin trapping layer with a hydroxyl group was introduced between the tunneling layer and the blocking layer. Novel trapping layer synthesize with the copolymer of 1,4-butanediol diacrylate (BDDA) and 2-Hydroxyethyl acrylate (HEA). Finally, we can fabricate low power and stable memory. Large window 5.86 V at programming/erasing voltage 16 V. Highly stable memory retention characteristics, after 10^8 s reduction in drain current of less than 0.5 order. In addition, excellent flexibility maintain memory performance after 2.7 % of strain applied.