

Mechanical Stability for Coplanar a-IGZO TFTs on Plastic Substrate

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We have developed high mechanical stability for self-aligned top-gate a-IGZO TFTs on polyimide (PI). High bending enables displays to be designed on rounded or curved shapes. Hence achieving high bending stability is a key technology in flexible display.

In this paper, we report the bending radius dependence of a-IGZO TFTs on PI. First, we measured mechanical stress in compressive and tensile curvatures, using bending jigs with bending radii of 100mm to 20mm. The device under compressive and tensile stress showed no sign of any degradation of threshold voltage at bending radius down to 20mm, as shown in Fig. 1. By improving the device reliability under bending stress, we successfully fabricated stable a-IGZO TFTs on flexible substrates.

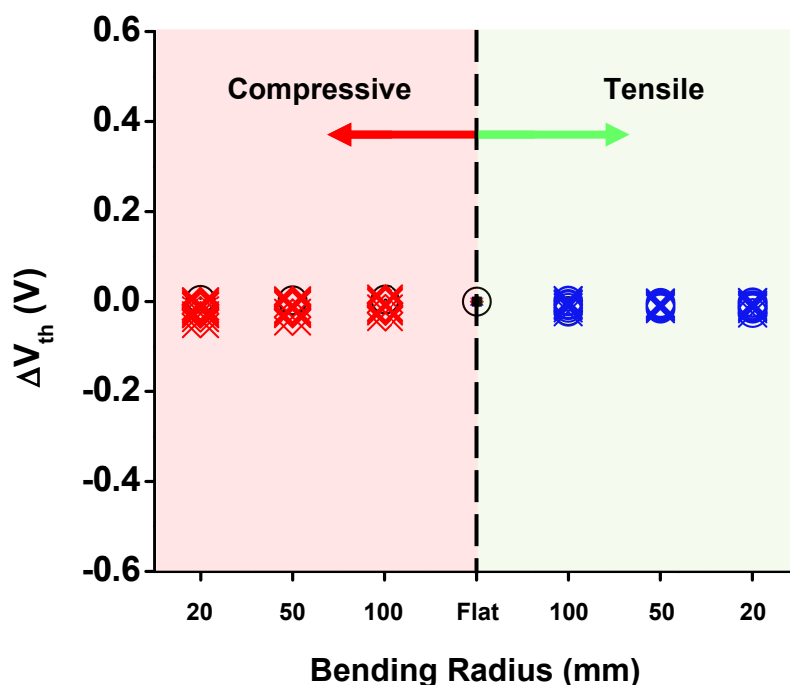


Fig. 1. Bending radius dependence of the threshold voltage

References

1. K. Nomura, H. Ohta, A. Takagi, T. Kamiya, M. Hirano, and H. Hosono, *Nature (London)* 432, 488 (2004).
2. B.Kim, Y.H.Jang, S.Y.Yoon, M.D.Chun, H.N.Cho, N.W.Cho, C.Y.Sohn, S.H.Jo, C.Choi, C.D.Kim, and I.J.Chung, *IDW 2005*, p.1073 (2005)
3. J.G.Yoon, H.Y.Kwon, M.R.Lee, Y.Y.Yu, N.C.Cheong, S.J.Min, J.K.Choi, H.B.Im, K.H.Lee, J.S.Jo, H.J.Kim, H.M.Choi, YB.Lee, C.K.Yoo, S.H.Kuk, M.G.Cho, S.Y.Kwon, W.S.Park, S.Y.Yoon, I.B.Kang, S.D.Yeo, *SID 2015*, p.965 (2015)