Study on back channeletching of IGZO transistor with new titanium alloy source/drain

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Amorphous metal-oxide semiconductors have attracted considerableresearch interest because of their high mobility and easy fabrication comparedto amorphous silicon semiconductors and low temperature poly silicon (LTPS)semiconductors.[1-5] Since InGaZnO (IGZO) surfaces are damaged byaggressive oxidants in wet chemicals during the wet etching process, etchstopper layers such as silicon oxide or silicon nitride are required. However,it is cheaper to fabricate back channel etching type (BCE) IGZO thin filmtransistors (TFTs) rather than etch stopper type IGZO TFTs. Therefore,increased attention has been paid to the BCE process, particularly whencombined with copper metallization.

In this paper, pure titanium, new titanium allys S/D electrodeswere compared in terms of electrical performances of BCE type IGZOTFTs.Therefore, the present study seeks to increase the titanium etching ratein a commercialized copper wet etchant with the lowest possible fluorideconcentration. To achieve this, a new alloy element is added into titanium topromote active dissolution in a persulfate solution with a lower fluorideconcentration to minimize IGZO damage.

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