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Reactive plasma process systems have been developed via installation of inductively-coupled plasmas (ICP) susta
with low-inductance antenna (LIA) for low-temperature fabrication of exible electronics, which require large area
and low damage processes with reactivity control capabilities at low substrate temperature. Major advantage of the reac
processing system is that the reactivity during lm-deposition processes can be enhanced and controlled via low-dama
and high-density plasma production for low-temperature processing of devices. e reactive plasma processes hav
been applied to sputtering deposition of transparent amorphous oxide semiconductor a-InGaZnOx (a-IGZO), which
has attracted great attentions as key material for next-generation exible electronics. So far post annealing at eleva
temperature (as high as 400°C) was required. us the conventional process for fabrication of the IGZO TFTs has bee
carried out on glass substrates. With the advanced reactivity controlled plasma processes in this study, a-IGZO thin- l
transistors (TFTs) with mobility as high as or higher than 40 cm^2/Vs was successfully formed at substrate temperature
less than 200°C. In this presentation, the reactive plasma processes are presented for low-temperature formation of IG
TFTs.

Recent Publications

1. K Takenaka, M Endo, G Uchida and Y Setsuhara (2018) Fabrication of high-performance InGaZnOx thin lm transistors based on control of oxidation using a low-temperature plasma. Applied Physics Letters 112:15210
2. K Takenaka, Y Setsuhara, J G Han, G Uchida and A Ebe (2018) Plasma-enhanced reactive linear sputter source for formation of silicon-based thin lms. Review of Scienti c Instruments 89(8):083902.
3. Kosuke Takenaka, Yoshikatsu Satake, Giichiro Uchida and Yuichi Setsuhara (2017) Low-temperature formatio of C-axis orientated aluminum nitride thin lms with plasma-assisted reactive pulsed-DC maggd ruo.1 (p)-9 ((o)

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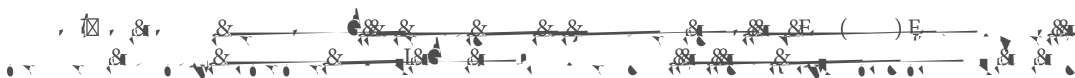

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