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몰리브덴 팁 표면처리의 전계 방출 특성에 미치는 효과
(Effects of surface treatment on emission characteristics of Mo Tip in AMFEDs)

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1. Introduction

Active-matrix field emission displays (AMFEDs) appears to be one of the most probable next generation flat-panel-display devices due to its CRT-like properties and the low driving voltage(<25V) etc. In this paper, we report AMFEDs with the active-matrix control (AMC) plates based on a-Si TFTs, and triode-type field emitters.

2. Experiments

The fabricated triode-type AMC is composed of inverted stagger-structured Si TFTs and Mo-tip FEAs. The usual Spindt process with an Al parting layer was used for the formation of Mo-tip FEAs. Also, a novel surface-treatment process, a cleaning with slight etching (CwE) using a solvent solution, was applied to the Mo-tip FEA to improve the field emission properties.

3. Results and Discussion

In order to apply the CwE treatment, pad process was followed by Al/Mo evaporation including lift-off using KOH.

After the CwE treatment, the voltage required of field emission decreased to ~70% of the initial value(~40V) and the stability of field emission was improved, indicating a possibility of very stable and short aging for FED devices.

The field emission currents are well controlled by TFT gate bias.