

## 1000-h Performance of Cold-Emitter Formed by MgO / ZnO:Al Whiskers

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### ABSTRACT

Nanoscale coating of magnesium oxide (MgO) that has anti-sputtering property and relative small electron affinity was applied on the top coating of the aluminum-doped zinc oxide (ZnO:Al) conductive whiskers. The MgO-coated ZnO:Al (MgO/ZnO:Al) whiskers were used for the ceramic field emitter and were evaluated on the 1000 h performance. A 1000 h performance test of the MgO/ZnO:Al whisker emitter was accomplished under conditions of a pressure of less than  $5 \times 10^{-5}$  Pa and an initial emission current of 100  $\mu$ A. Scanning electron microscopy revealed that the whisker emitter had relatively small damage on the top region after performance.

**Keywords:** Field Emission, ZnO, Whisker, MgO, Ion Bombardment, CVD