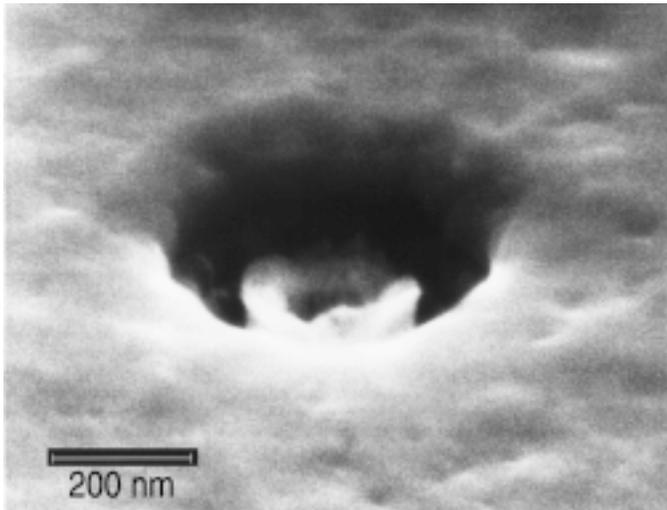
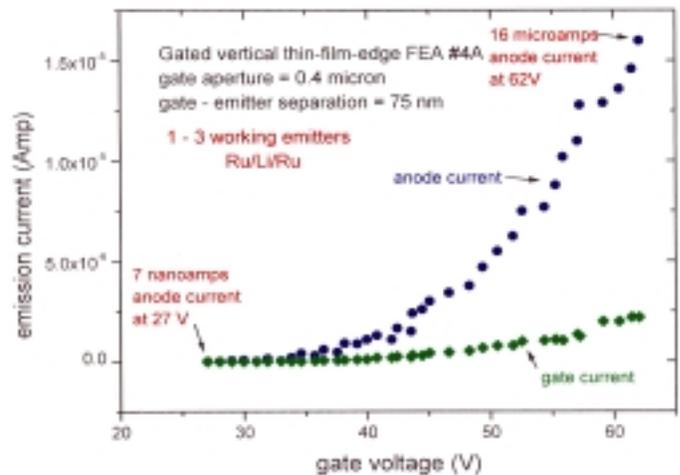


MICROFABRICATED ELECTRON SOURCE



Single gated Ru/Li/Ru thin-film-edge FEA cell



This gated vertical thin-film-edge field emitter array (FEA) produces electrons via field emission from the sharp edge of microfabricated, chemical vapor deposited, vertical multilayer film emitters. Operating as a “dispenser” FEA, the device produces high currents per FEA cell at low gate voltages and has shown to be resistant to poisoning by residual room air.

The advantages of this gated thin-film-edge FEA include:

- Inexpensive fabrication due to few processing steps (1/3 as many compared to standard conical designs) and elimination of lithography.
- Much higher emission current per emitter compared to conical designs (see figure above).
- Insensitive to relatively poor vacuum (10^{-6} Torr) due to dispenser mechanism.
- Low voltage operation due to low work function material.
- Insensitive to dulling by ions compared to conical designs.
- Low capacitance due to arbitrarily tall emitter height (all cell dimensions independently adjustable).

The gated vertical thin-film-edge FEA can be used for flat panel displays, high voltage power grid switches, RF power amplifiers, mass spectrometers, and other applications that require, or would benefit from, cold electron sources with low power requirements.

Patent licenses are available to companies with commercial interests.

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