

## **21d Present Status of Formic Acid Fuel Cells**

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### Formic Acid Fuel Cells For Portable Power

Formic acid fuel cells are likely to be one of the first fuel cell products in the marketplace. This paper will review the present state of the technology. The cells operate near room temperature and can produce enough power to operate a cell phone in a size consistent with the phone. The IV curves show near PEM performance. Work with a reference electrode, show that at open cell, the cathodes remain at 1 V, even with formic acid present, while the anode sits at 0.07 V with respect to RHE. As the cell draws current, the cathode potential changes greatly, but the anode potential only changes by 0.1 V at currents of 800 ma/cm<sup>2</sup>. Recent improvements include better gas diffusion layers to prevent CO<sub>2</sub> accumulation in the membrane, and the development of regeneration cycles to prevent CO buildup from impurities.

Outstanding issues include the influence of fuel impurities (Methanol, methyl formate, acetic acid ...) on performance, and understanding the long term degradation of the system after hundreds or thousands of hours of use.