

Enhanced Selectivity of Steam Reforming Catalysts for the Development of Miniature and Micro Fuel Cells
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Several strategies have been proposed for production of miniature and micro fuel cells. Most researchers agree that methanol is the fuel of choice for miniature and micro fuel cells. Two major pathways are possible for reaction of methanol. The first involves oxidation of methanol with air or oxygen via electrochemical methods. Another approach involves the generation of H₂ from methanol via autothermal catalytic methods. We are using the latter approach in our research. Some of the goals of our project are as follows:

1. Preparation of active steam reforming catalysts with minimized CO production.
2. Syntheses to produce well mixed transition metal systems supported on alumina.
3. Use of plasma methods of synthesis to produce active and selective catalysts.
4. To test the catalytic activity and selectivity as well as develop mechanistic studies of reactions and intermediates that occur in steam reforming reactions.

We expect to produce new catalysts that can be used in steam reforming. These catalysts could be used in conjunction with steam reforming reactions in small portable power supplies and other devices. We also plan to supply our collaborators, Drs. Fenton, Kunz of UCONN with synthetic H₂ feeds that are produced with this catalyst. Finally we expect to be able to scale-up production of the catalyst so that others such as Fuel Cell Energy could potentially use this catalyst in commercial applications.