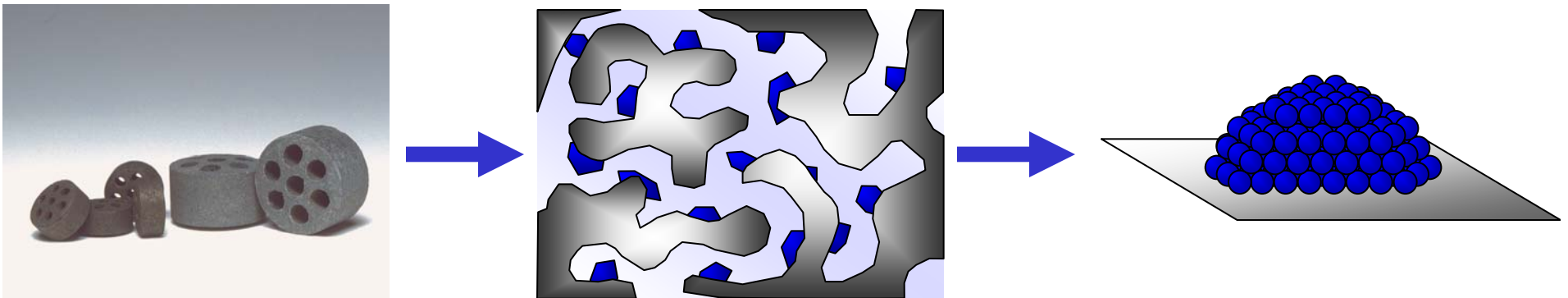


Catalytic H₂ Production by Metal Nanoparticles

Lucas Cameron
IGERT Fellow
Department of Chemical Engineering
Advisor: Charles Campbell
March 6th, 2007

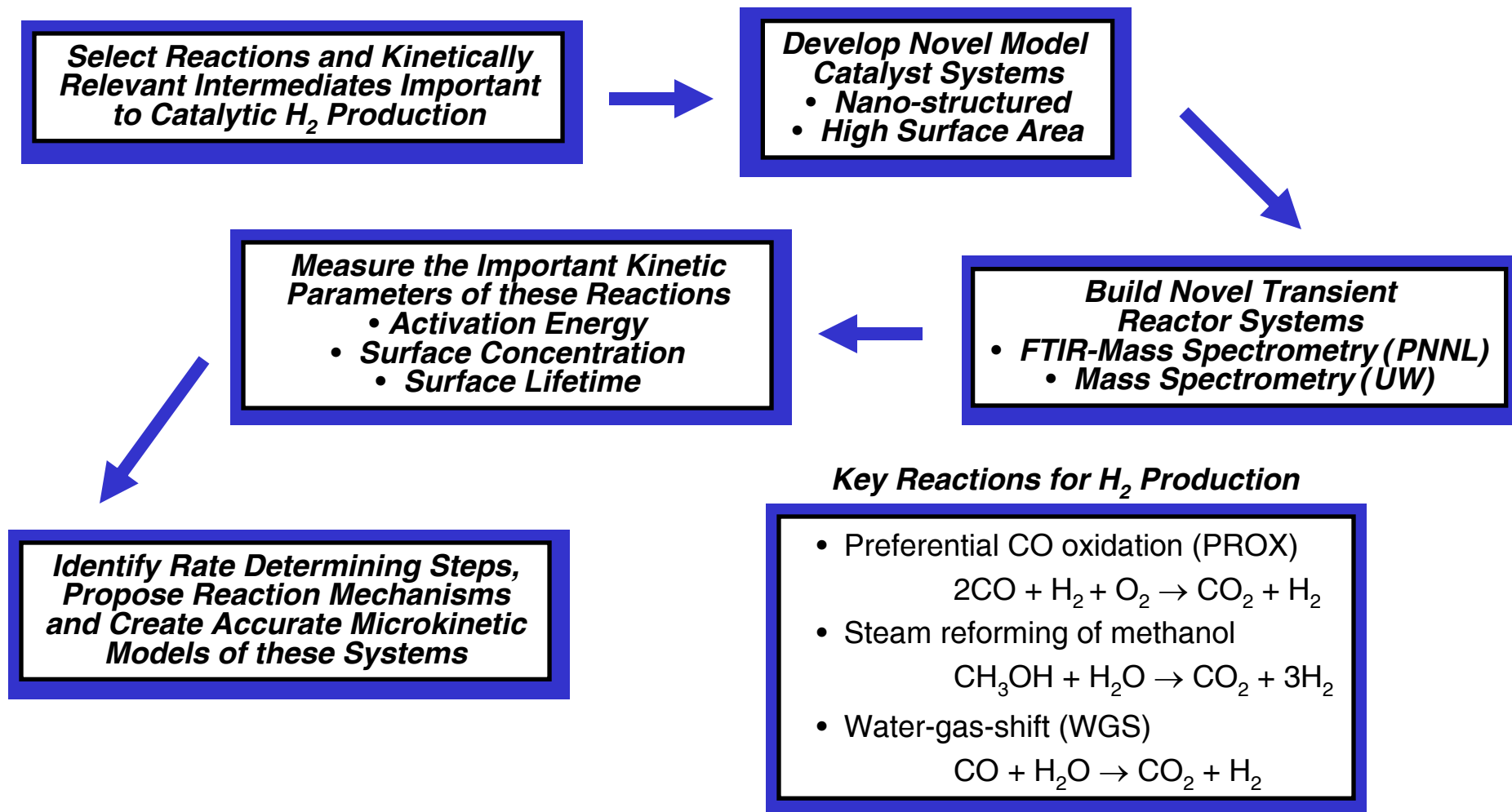
Developing a Fundamental Understanding of Catalytic Processes Important to Hydrogen Production from Fossil Fuel Sources: **Novel Nano-structured Catalysts and Experimental Techniques**



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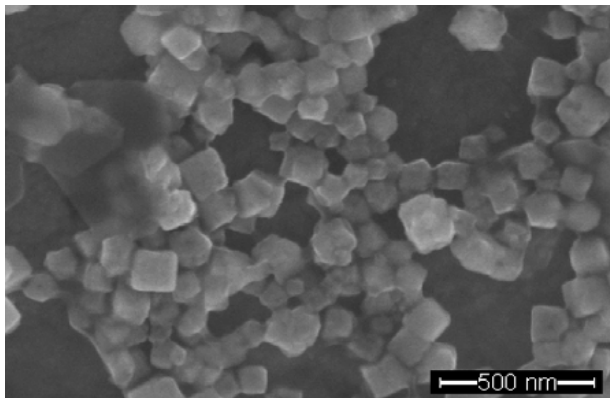


Catalytic H₂ Production by Metal Nanoparticles

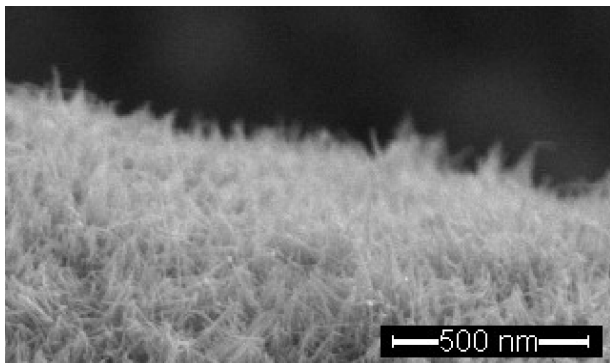


Catalytic H₂ Production by Metal Nanoparticles

Novel Nano-structured Catalysts

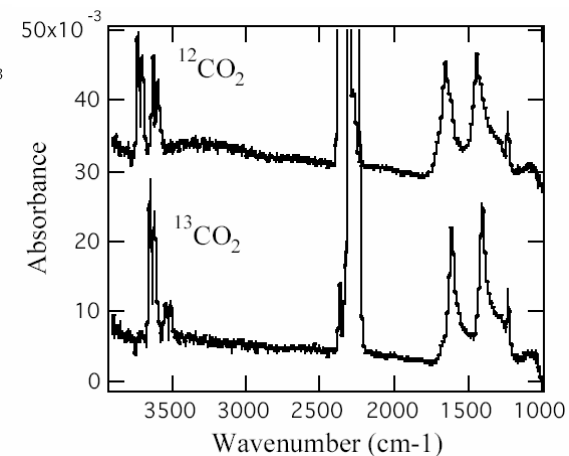
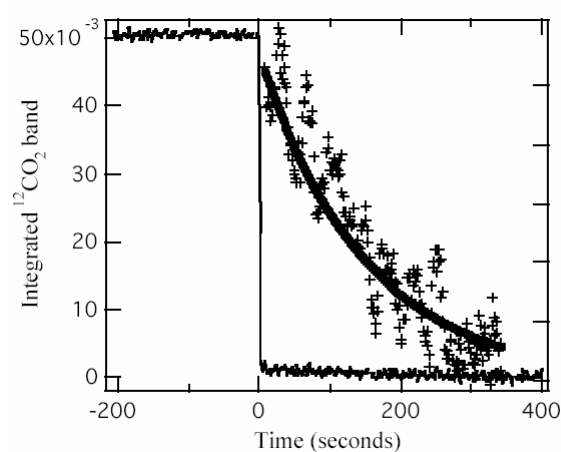


Cu Nanocubes: 6-sided, (100) facet



Pt Nanowires (Eric Lee, Xia Group)

Novel Transient Reactors (PNNL)



- *CO₂ adsorbed on Al₂O₃ at 378 K and 1 bar*
- *Transient Kinetic Analysis (TKA) allows for quantitative study of kinetically relevant parameters:*
 - $N_{CO_2} = 24 \text{ molecules/nm}^2$
 - $\tau_{CO_2} = 150 \text{ sec}$
- *FTIR enables in situ spectroscopic probe of important surface intermediates.*



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