



SYNTHESIS OF ATOMICALLY DISPERSED M-N-C CATALYSTS VIA SELECTIVE METALATION

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The Invention

UW-Madison researchers have developed a solution-phase metalation method for increasing M loading on N-C. The N-C supports are synthesized by high-temperature pyrolysis of N, C precursor mixtures (e.g., MOF, PANI, Phen, and Mel). Macrocyclic N₄ sites on the surface are metalated (e.g., CoCl₂ in DMF using Bu₃N to drive the deprotonation equilibrium). Basic conditions lead to strong electrostatic adsorption of cationic M species at deprotonated surface acidic moieties. A mild acetic acid wash removes these species but leaves MN₄ intact. A final pyrolysis step is used to remove ligating solvent or chloride from the MN₄ site, rendering it catalytically active.

Key Benefits

- Can allow for novel M-N-C materials
- Potential compatibility with any metal stable in DMF at 150 degrees
- Potential tunability of N content, configuration, and also porosity parameters

Additional Information

For More Information About the Inventors

- [Shannon Stahl](#)

Tech Fields

- [Materials & Chemicals : Catalysts](#)

For current licensing status, please contact Jennifer Gottwald at jennifer@warf.org or 608-960-9854