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# Preparation Of Stable 1H-1,2,3-Triazol-5-Ylidenes: New Stable Mesoionic Carbenes

Tech ID: 34187 / UC Case 2010-703-0

## PATENT STATUS

Country	Туре	Number	Dated	Case
United States Of America	Issued Patent	9,403,781	08/02/2016	2010-703
FULL DESCRIPTION				
Destaurant				
Background				
The performance of metal catalysts is c	itical in the chemical, pharmace	uticals, and materials	industries. However, ma	any conventional catalysts
use ligands that are unstable, sensitive	to air and moisture, or require be	eing used in excess. T	his complicates process	ses and increases cost.

#### Technology

Research team at UCR, have developed a patented technology - a class of stable, mesoionic carbenes designed for use as ligands in metalbased catalysis. The invention provides carbenes that are stable, crystalline and easy to handle. The developed carbenes bind with exceptional strength to metals, yielding highly robust catalytic complexes. Catalytic complexes can perform difficult chemical transformations with high efficiency.



A short modular synthesis allows the preparation of novel stable heterocycles that feature a lone pair of electrons on a carbon center. The donor properties of these mesoionic compounds are greater than those of classical N-heterocyclic carbenes; they are accessible bt deprotonation of the corresponding conjugate acids using comparitively mild bases.

#### **ADVANTAGES**

- > The carbene ligands are stable enough to be bottled and handled under normal conditions thereby simplifying storage and use.
- ▶ The resulting metal catalysts demonstrate high resistance to oxidation and are less sensitive to air and moisture.
- The strong carbene-metal bond avoids the need for excess ligands in catalytic reactions reducing waste.
- > The synthesis method is modular and allows for the creation of a wide variety of carbene structures tailored for specific applications.

#### SUGGESTED USES

- > Pharmaceutical synthesis facilitating complex molecular construction through reactions like Suzuki coupling and amine arylation.
- Enabling efficient carbon-carbon and carbon-heteroatom bond formation for producing high-value chemicals.
- Creating advanced materials through olefin metathesis reactions.
- Streamlining the synthesis of active ingredients in agrochemicals.

#### STATE OF DEVELOPMENT

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#### **OTHER INFORMATION**

**KEYWORDS** 

mesoionic carbene, organometallic

catalyst, ligand synthesis, Nheterocyclic carbene, 1,2,3-Triazol-5ylidene, suzuki coupling, olefin metathesis, pharmaceutical synthesis,

cross-coupling reactions, stable

carbene, robust catalysis, air resistant catalyst

#### CATEGORIZED AS

#### Materials & Chemicals

- Chemicals
- Medical
  - Research Tools
- Agriculture & Animal Science

Chemicals

RELATED CASES

2010-703-0

Proof-of-concept has been demonstrated, and specific compounds have been synthesized and characterized in the lab.

### **RELATED MATERIALS**

Crystalline 1H-1,2,3-Triazol-5-ylidenes: New Stable Mesoionic Carbenes (MICs)

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