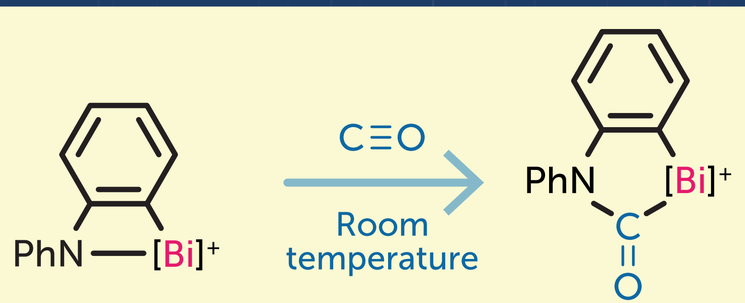
A radical idea: Bismuth as an alternative to transition metals in chemical synthesis

Rare elements in conjunction with carbon monoxide (CO) form metal carbonyls that act as intermediates in the synthesis of versatile materials.

As their availability is limited and they can carry environmental concerns, replacing them with alternative and environmentally benign elements is essential.

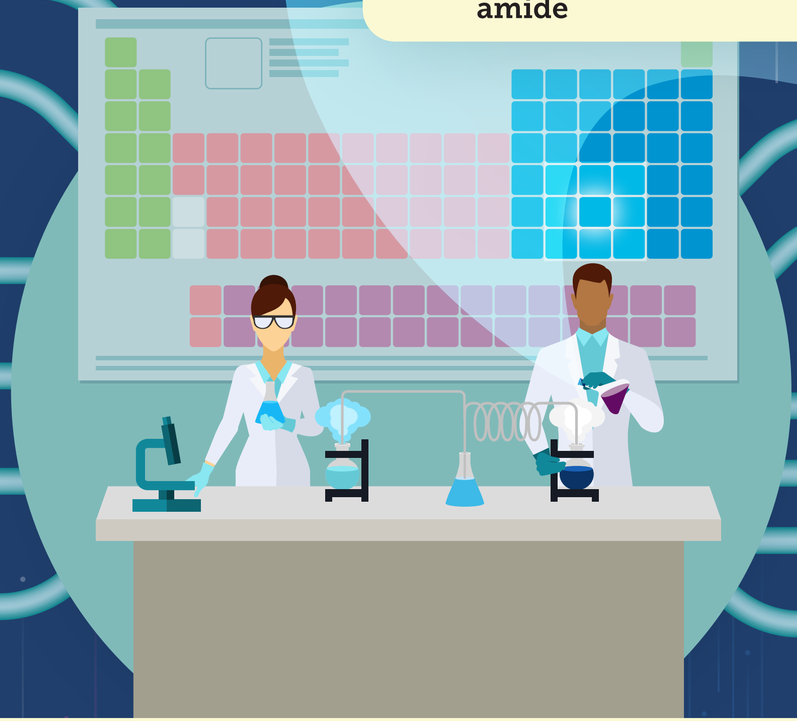
Successful insertion of CO in bismuth amide under mild conditions.



Bismuth amide

Cationic bismuth carbamoyl

- Photochemistry applications
- High potential for radical stabilization
- Suited for small molecule activation
- First ever cationic bismuth carbamoyl species



- Low-toxicity
- Economical
- Easily synthesized
- Versatile building block in synthetic chemistry

Novel bismuth carbamoyl paves the way for innovative applications in fundamental chemistry and industry.

Chemical Science

PICK OF THE WEEK

Carbon monoxide insertion at a heavy p-block element: unprecedented formation of a cationic bismuth carbamoyl

Bickelhaupt, Lichtenberg *et al.* (2019)

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