Formal Hydroacylation of Alkynes on Mg$_3$Al–CO$_3$-Layered Double Hydroxide

Significance: Mg$_3$Al–CO$_3$-layered double hydroxide (Mg$_3$Al–CO$_3$ LDH) catalyzed the formal hydroacylation of terminal alkynes with aromatic aldehydes under argon to give the corresponding diaryl α,β-unsaturated ketones in up to 85% yield (24 examples).

Comment: In the reaction of phenylacetylene with p-anisaldehyde, Mg$_3$Al–CO$_3$ LDH was recovered and reused three times with a slight loss of its catalytic activity (fresh: 91% yield; third reuse: 73% yield).

Selected examples:

- R = OMe, 76% yield
- R = H, 71% yield
- R = Me, 68% yield
- R = CF$_3$, 53% yield
- R = Cl, 78% yield
- R = NMe$_2$, 64% yield
- R = CN, 54% yield

O

Ph

Mg$_3$Al–CO$_3$ LDH

(130–200 mg)

PhMe, 120 °C, 15–24 h
argon atmosphere

R$^1$   R$^2$

(0.5 mmol) (1.2 equiv)

24 examples up to 85% yield