Synthesis of N-Alkylcyclohexylamines on Supported Rh/Pt Nanoparticles

**Significance:** Rh/Pt bimetallic nanoparticles (NPs) supported on dimethylpolysilane and alumina (Rh/Pt–DMPSi/Al$_2$O$_3$) promoted the synthesis of N-alkylcyclohexylamines from anilines and the corresponding N-alkylamines to give the corresponding alkylcyclohexylamines in up >99% yield. N-Methylaniline and nitrobenzene also underwent the reductive coupling with octylamine to afford N-octylcyclohexanamine in yields of 89% and 87%, respectively.

**Comment:** The authors previously reported the preparation of Rh/Pt–DMPSi/Al$_2$O$_3$ and its application in arene hydrogenation (J. Am. Chem. Soc. 2018, 140, 11325). In the reaction of aniline with octylamine, the catalyst was used four times without significant loss of its catalytic activity (fresh: 92% yield; fourth reuse: 90%).

**Results:**

- **RNH$_2$** + **H$_2$N-C$_6$H$_4$** (2.5 equiv) → **RNH$_2$**
  - 93% yield
  - 89% yield (N-methylaniline was used instead of aniline)
  - 87% yield (nitrobenzene was used instead of aniline)

- **H$_2$** (1 atm), 50 °C, 24 h

- **92% yield** (for 72 h)

- **97% yield** (for 38 h)

- **85% yield**

- **>99% yield**

**Key words**
- rhodium catalysis
- platinum catalysis
- aniline
- alkylcyclohexylamines