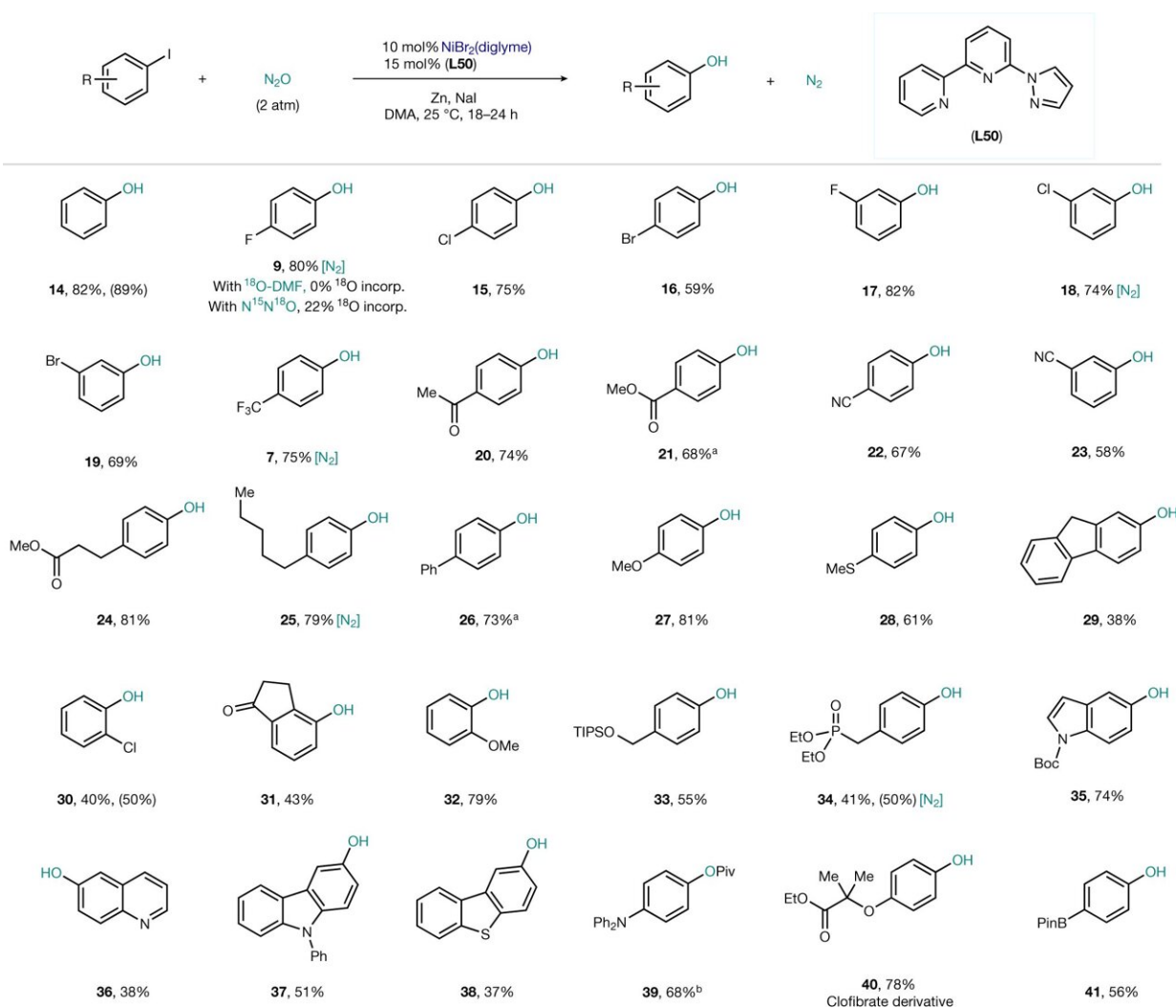


Catalytic synthesis of phenols with nitrous oxide

May 9 2022



Revalorization of N₂O as O source in the catalytic synthesis of phenols. Scope of aryl iodides. [N₂], N₂ detected by a gas chromatography–thermal conductivity detector at the end of the reaction. All yields are of isolated pure material. Yield

in brackets: ^1H NMR yield calculated using dibromomethane as an internal standard. incorp., incorporated. See the Supplementary Information for details of the procedures. ^aUse of L18 as the ligand instead of L50. ^bOwing to the rapid oxidation of the free alcohol, 39 was obtained after quenching with Piv_2O . Credit: *Nature* (2022). DOI: 10.1038/s41586-022-04516-4

The emission of greenhouse gases threatens the global environment, and scientists around the world are increasingly committed to addressing this issue. While many research groups focus on carbon dioxide (CO_2) or methane (CH_4) revalorization strategies, a team led by Dr. Josep Cornellà at the Max-Planck-Institut für Kohlenforschung has focused on a lesser-known gas that also contributes significantly to global warming: nitrous oxide (N_2O), also known as "laughing gas."

Nitrous oxide has a [global warming](#) potential approximately 300 times higher than that of [carbon dioxide](#), and is known to be an ozone depletion agent. As a result of human activities, emissions of [nitrous oxide](#) have increased by up to 2% in recent decades.

However, Josep Cornellà's group considers this molecule far too valuable to be emitted into the atmosphere. N_2O is indeed a great source of O atoms, and the byproduct generated is N_2 , molecular nitrogen, which is harmless. The challenge, however, was that for a long time, N_2O was considered an inert gas requiring drastic measures to grab the O atom from its structure. However, in their work, now published in *Nature*, the team at the Cornellà Lab has shown that this can be achieved by reacting N_2O with a simple catalyst under mild conditions to make phenols, valuable compounds for industry

"Catalytic synthesis of phenols with nitrous oxide" was published in *Nature*.

More information: Franck Le Vaillant et al, Catalytic synthesis of phenols with nitrous oxide, *Nature* (2022). [DOI: 10.1038/s41586-022-04516-4](https://doi.org/10.1038/s41586-022-04516-4)

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