Anion-encapsulating sodium alkoxide clusters (X@RONa)

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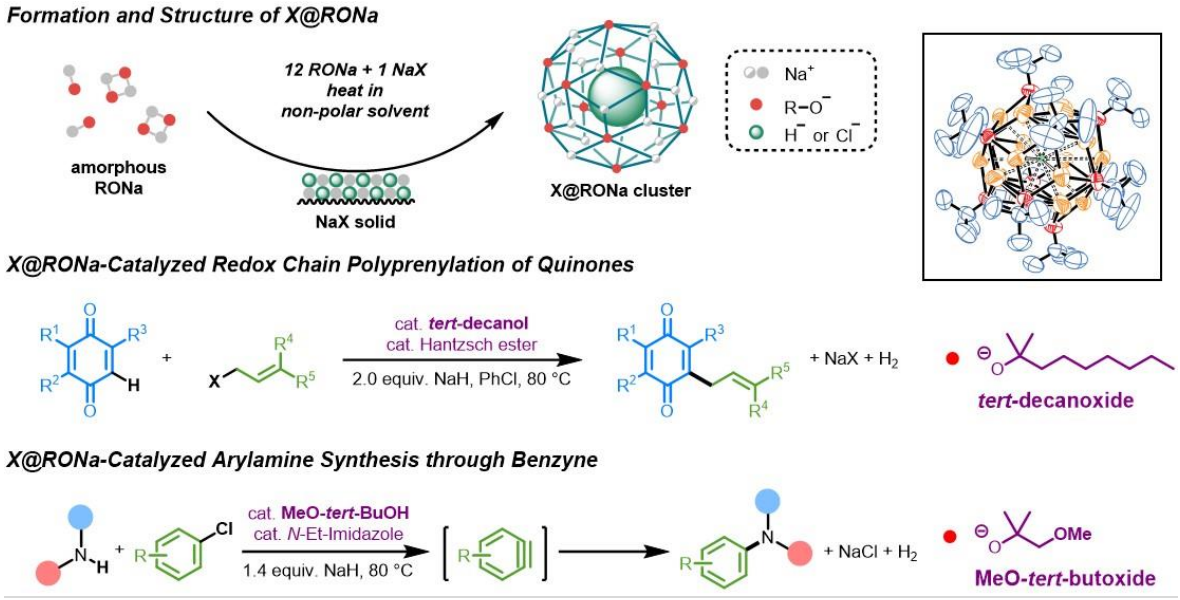
Sodium *tert*-butoxide formed dodecameric anion-encapsulating molecular clusters $(NaO\textit{t}\text{-Bu})_{12}NaX$, or X@*t*-BuONa, where X is the encapsulated anion. They can be designed to customize their catalytic functions.

First, X@RONa was able to promote transition-metal-free polyprenylation of quinones through redox chain mechanism.[1] Many biologically important polyprenylquinones were synthesized from corresponding parent quinone and polyprenyl halide in one step and high yield.

Second, X@RONa was applied in catalytic scalable, transition-metal-free C-N bond formation.[2] X@RONa was capable of catalytically promoting benzyne formation from simple aryl chlorides, as well as the subsequent arylation of amines. From very simple and cheap aryl chlorides, aryl amines can be easily synthesized in large scale. It is also a rare case of large-scale application of benzyne.



References

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Biography of Speaker

Professor Zhi Li received bachelor's degree from University of Science and Technology of China, PhD degree from the University of Chicago under the supervision of Prof. Hisashi Yamamoto, and performed postdoctoral research at Northwestern University with Prof. Tobin Marks. In 2015, he started his independent career at ShanghaiTech University in China as Assistant Professor, and was promoted to tenured Associate Professor in 2021. His research interests covered green chemistry and catalysis, in particular new reactions utilizing renewable feedstock, eco-friendly conditions, and low-cost reagents and catalysts. He is also interested in studying the applications of new synthetic substances in materials science. His personal recognitions include Reaxys PhD prize finalist, Thieme Chemistry Journal award, Education award of the Chinese Academy of Sciences, and Distinguished lecture award from Chemical Society of Japan.