Catalytic performance for direct syngas conversion to olefins. a Comparison of catalytic performance among Na-Ru/SiO$_2$ and other previously reported catalysts. (a: C$_{2-4}$ = selectivity). b Detailed product distribution (including CO$_2$) and ASF distribution of hydrocarbons over Na-Ru/SiO$_2$ catalyst. c Product selectivity, CO conversion and olefins yield at different H$_2$/CO ratios in syngas over Na-Ru/SiO$_2$ catalyst at 533 K, 3000 mL·g$_{cat.}^{-1}$·h$^{-1}$, and 1.0 MPa. d Product selectivity, CO conversion and olefins yield at different space velocities over Na-Ru/SiO$_2$ catalyst at 533 K, H$_2$/CO ratio of 2 and 1.0 MPa. e Stability test for
Na-2%Ru(P)/SiO$_2$ catalyst. Reaction rate of CO and product selectivity at different Na/Ru molar ratios. Reaction conditions: 533 K, 1.0 MPa, 3000 mL·g$_{\text{cat.}}^{-1}·h^{-1}$, H$_2$/CO ratio of 2. Credit: *Nature Communications* (2022). DOI: 10.1038/s41467-022-33715-w

Olefins are key building blocks to manufacture a wide range of value-added products such as polymers, lubricants, plasticizers, drugs, detergent and cosmetics.

Syngas conversion serves as a competitive strategy to produce olefins from nonpetroleum resources. However, the goal to achieve desirable olefins selectivity with limited undesired C1 by-products remains challenging.

Recently, a research team led by Prof. Zhong Liangshu from the Shanghai Advanced Research Institute (SARI) of the Chinese Academy of Sciences has reported a non-classical Fischer-Tropsch to olefins (FTO) process, which can realize 80.1% olefins selectivity with ultralow total selectivity of CH$_4$ and CO$_2$ (Citation: Direct production of olefins from syngas with ultrahigh carbon efficiency (2022, October 12) retrieved 26 November 2023 from https://phys.org/news/2022-10-production-olefins-syngas-ultrahigh-carbon.html)