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COMMERCIAL CARBON NANOTUBES AS EFFICIENT CATALYSTS FOR ALKENE SYNTHESIS

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We herein report a facile and sustainable route to synthesize the alkenes as important monomers in modern polymer industries. After simple modification, the commercial CNTs efficiently catalyze the reaction under a mild condition. Tubular structure keeps intact during the whole process (1). This study will renew scientific and technological interests on large-scale applications of CNTs.

Oxidative dehydrogenation of butane is an energy-saving technology to synthesize butenes and butadiene. The development of transition metal-based catalysts has been hindered by the big challenges in both selectivity and long-term stability. By using metal-free CNTs as catalysts, we were delighted to observe a high selectivity during a continuous reaction over 100 hours. At a same conversion of butane, surface-modified CNTs are much more selective than the well-developed V-Mg-O catalysts. The metal-free mechanism is well confirmed by both *in-situ* characterizations and DFT calculations. The application of CNTs as a heterogeneous catalyst is attractive due to the favorable management of energy.

Reference:

1. J. Zhang, X. Liu, R. Blume, A.H. Zhang, R. Schlögl, D.S. Su, *Science* **322** (2008) 73–77.