



Schematic diagram of the deoxygenation mechanism of bio-oil in the pyrolysis of sludge catalyzed by CaO was shown in the figure. The pyrolysis of Carboxylic acid compounds (RCOOH) by CaO catalytic microwave can be divided into two reaction pathways. One, under the microwave irradiation, RH and CO<sub>2</sub> was produced directly from cracking. Second, with CaO catalyst, (RCOO)<sub>2</sub>Ca the organic calcium salt of carboxylic acid was produced after the dehydrogenation and dehydration, thus carboxyl oxygen groups were fixed in the form of the organic calcium salts, and (RCOO)<sub>2</sub>Ca during the high temperature microwave pyrolysis continued to crack and produced CaCO<sub>3</sub> and the ketone functional compounds (RCOR), while CaCO<sub>3</sub> can decompose to produce CaO and CO<sub>2</sub>, and the CaO production can be recycled to be used as catalyst again.