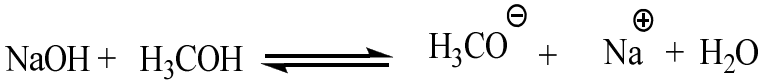
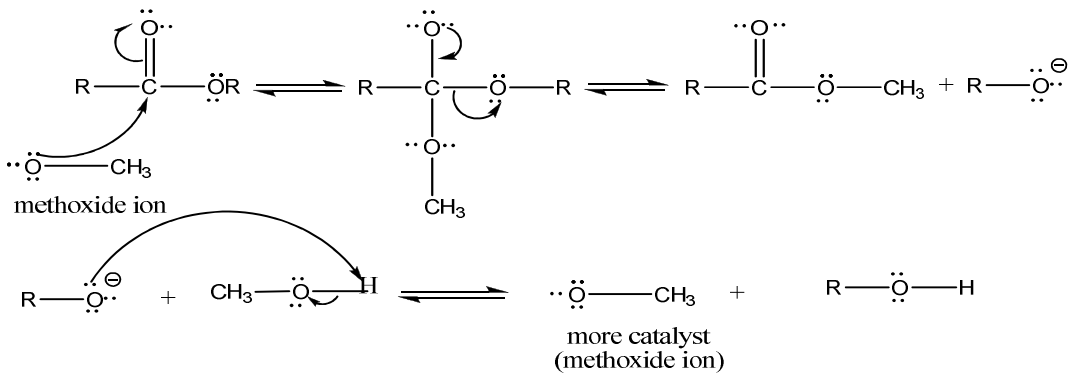
Transesterification reaction mechanism

1- Pre-step: preparing the catalyst (methoxide ion) by adding Sodium hydroxide to the methanol prior to entering the transesterification reactor



Preparing the catalyst (methoxide ion) (2)

2-Transesterification mechanisms: nucleaphilic attack by the methoxide ion releases the fatty acid chain from the triglycerides backbone, creating more catalyst.



Transesterification mechanisms (3)

Economic and Commercial Approaches

At present, the high cost of biodiesel is the main obstacle to its commercialization. Therefore, it's not surprising that biodiesel produced from pure soybean oil costs much more than petroleum-based diesel [17] . The higher cost of biodiesel is due to its production from expensive high-quality virgin oil, but using low cost feedstock, such as waste frying oils and non-edible oils might help reduce the price. According to S&T Consultants Inc. and Meyers Norris Penny LLP 2004, [18] in the United States, the price of biodiesel, on average, was 2.22 US$/US gallon, while petroleum diesel fuel cost 1.21 US$/US gallon. More recently, researchers have attempted to utilize used cooking oil (UCO) as a feedstock for biodiesel production.