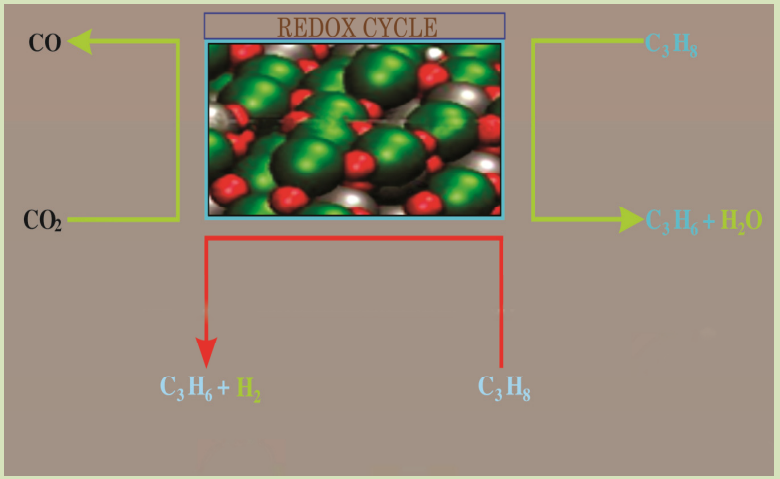
Dehydrogenation of Propane

Background

- Propylene is one of the most important feedstocks in the chemical industry that serves as a precursor for the synthesis of a wide variety of chemicals.
- The global demand of propylene, currently 100 MMT, is continuously growing at a growth rate of 4% a year.
- Traditionally, propylene is produced as a byproduct in steam cracking and fluid catalytic cracking units. These methods alone now cannot meet the increasing demand in global market and moreover, are not ideal on economic basis.
- There is now increasing interest in on-purpose and low cost technologies such as propane dehydrogenation in which propylene is the intended end product.



Technological Approach

- Catalytic Dehydrogenation of Propane is realized by its reduction to Propylene, by the subtraction of a molecule of hydrogen

  $CH_3 - CH_2 - CH_3 \rightleftarrows CH_3 - CH = CH_2 + H_2$
- Since the reaction is endothermic and associated at an increasing of the number of moles, is favoured at high temperatures and low pressures. However, the temperature increase promotes the formation of by-products such as coke and other products of thermal cracking which are thermodynamically more stable
- To optimize the Propylene yield and minimize unwanted by-products, it is therefore, necessary to work in conditions close to atmospheric pressure and at temperatures not exceeding 700°C