Motivation

- Oligomerization of light olefins (C₂ - C₄)
  - Zeolites [1 - 4]
  - Mesoporous aluminosilicates [5]
  - Solid phosphoric acid [6]
  - N-heterocyclic carbenes [7]
  - Zeolites – High activity & suitable selectivity → branched C₁₀ alkanes – high octane number
  - Regenerated by burning off coke

Effect of Temperature

- High catalytic activity over FAU 6
- Increase in oligomerization and cracking with increase in temperature
- High cracking activity over 200°C
- Reduction in selectivity with increase in temperature

Effect of Exchange of Active Acid Sites by Na⁺ Ions

- Increase distance between acid sites → acid strength constant
- Reduce cracking of the long chain olefins
- Mass of zeolite for reaction maintained constant

FAU (Si/Al 15)

- Coupled reaction of C₁₀ cracking and oligomerization of C₂ - C₃ olefins
- High coking by formation of aromatic compounds

Initial concentration of pentene: 300mM
Temperature: 200°C
Mass of zeolite: 11.4 mg