h-tec Energy Technology Projects

Fact Sheet Technology	
Subject:	**Bergius 2: 1952 – 1964**
Rev:	**April 2006**
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Bergius-Pier Process (2)

1. History in brief

In 1952 the allied ban to operate hydrogenation plants in West Germany expired. Major developments in Gas Phase catalysts enabled the direct connection of the Gas Phase process step to the Liquid Phase step in one high pressure recycle gas loop. The overall process scheme was entitled “Combi Cracker”.

2. Technology – 2nd development, 1952 - 1964

2.1 Overall Process

Process characteristics:

◊ “Liquid Phase” and “Gas Phase” integrated in one recycle gas loop

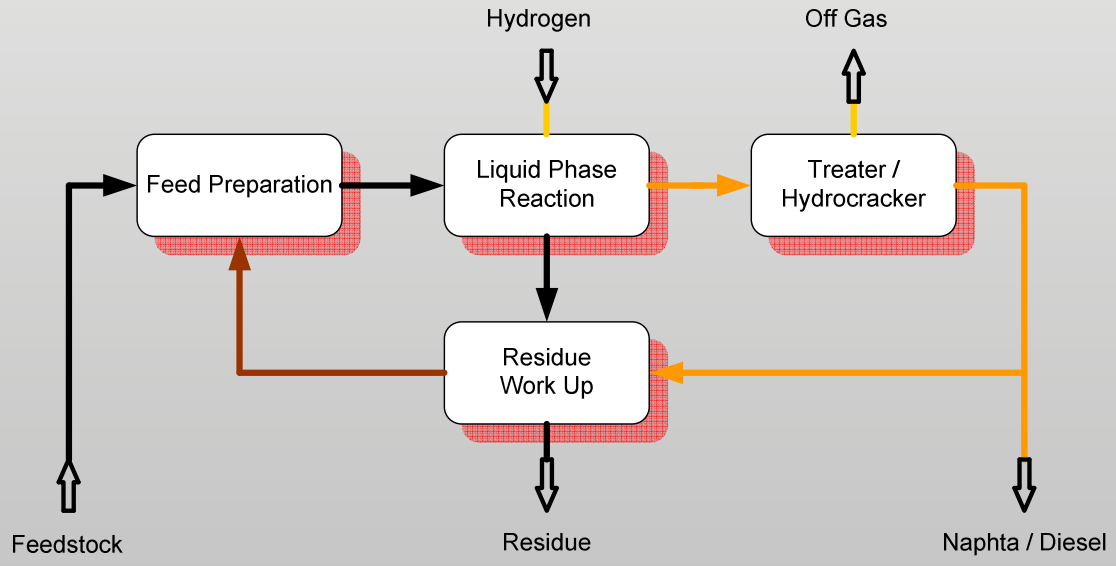

Fig. 1: Block Diagram Bergius-Pier 2nd development status

Objectives:

◊ Increased Efficiency

◊ Less equipment

Disadvantages:

◊ Less specific throughput due to high oil recycle to Feed Preparation

◊ High asphaltene level in the liquid phase

2.2 Liquid Phase reaction section, second development 1952-1964

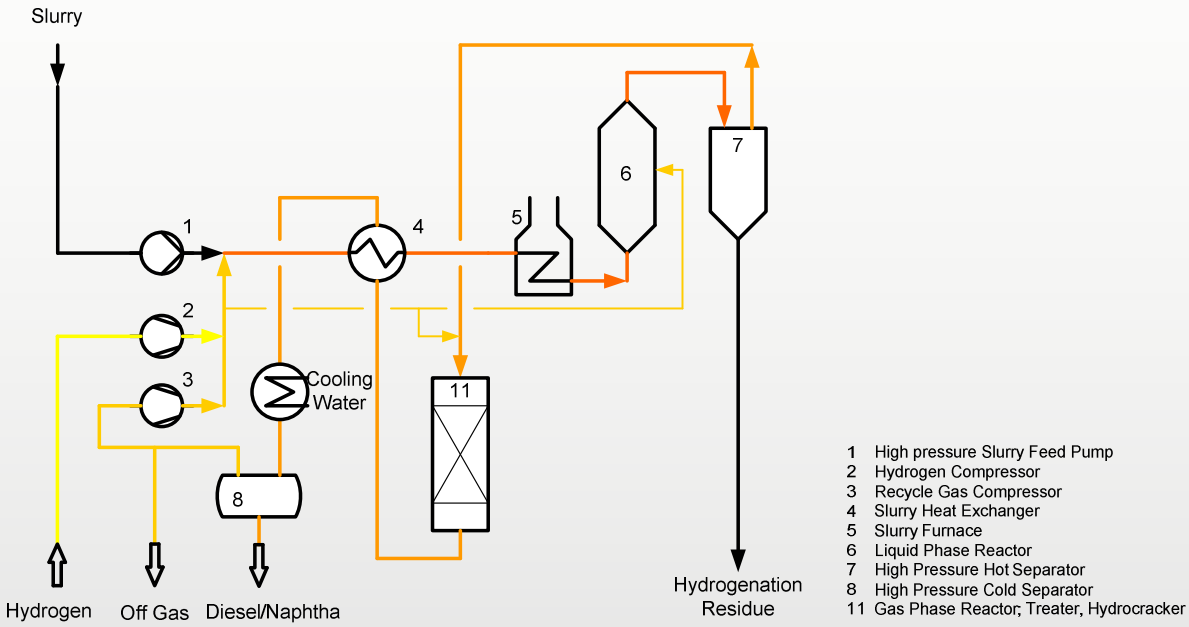

Fig. 2: Liquid Phase

The step to fully integrate the Gas Phase reactor section (11) together with the Liquid Phase reactor section of the Bergius-Pier process into one common high pressure recycle gas loop was realized after the second World War at the “Scholven Chemie Refinery” plant in Gelsenkirchen, Germany. This became possible due to the now commercially available sulphur resistant catalysts for the Gas Phase section. The general arrangement of the Bergius Pier process was kept, but downstream of the high pressure hot separator (7) the Gas Phase reactor was now integrated into the high pressure process loop.

This process configuration was named “Combi-Cracker”. Other process units like the Feed Preparation or the Residue Work Up were not changed in general. Fig. 3 shows the typical temperature profile of the “Combi Cracker”.

Fig.3:
Flow scheme and temperature profile “Combi Cracker”, 1955

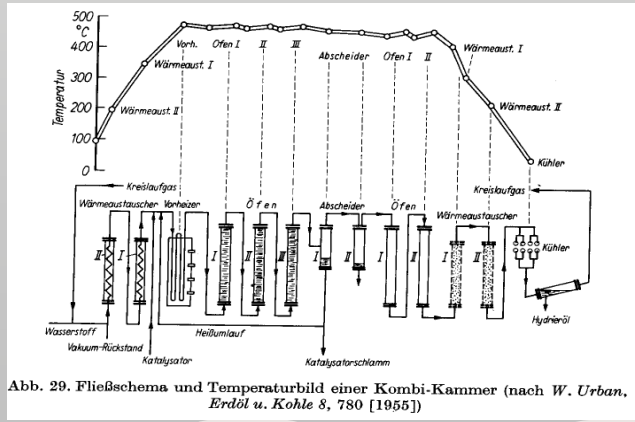

Abb. 29. Fließschema und Temperaturbild einer Kombi-Kammer (nach *W. Urban, Erdöl u. Kohle 8*, 780 [1955])