There are no translations available.

One of the most important parameters which determine the yield, the quality of FCC products and general the competiveness of FCC unit is the catalyst type. So it is essential with short and reliable laboratory tests the prediction of the effectiveness of FCC catalyst to be taken place. With these test the refineries can choose the most satisfactory catalyst.

The last years the CPERI laboratory has been equipped with the appropriate systems for the technological support of the refineries in the area of catalytic cracking. The most important equipment for this evaluation is the MAT unit.

MAT unit description

The Microactivity Test (MAT) unit used for the experiments in CPERI has been designed according to the ASTM D-3907 method with some modifications. It is made of a pyrex fixed bed reactor heated by a three zone furnace (Figure 4). Feed is injected, using a controlled syringe pump, through an independently controlled preheat device just above the catalyst bed. Vapour products of the cracking are cooled to 0 °C at the reactor exit where part of them are condensed and collected in a specially designed liquid receiver. The remaining not condensed gaseous products are led to a gas collection system. Three N_2 flows are used during MAT experiments in order to drive the feed and products along the reactor and purge the injection system. Two of the above mentioned N_2 streams are continued for a long time (30 sec) after the experiment in order to strip the receiver liquid products. The gaseous products are analyzed at a specially designed GC called Refinery Gas Analyzer (Varian 3400 model). This GC is equipped with four columns and two detectors (TCD and FID). The conversion of liquid products is measured by a GC equipped with a Megapore OV-101 column (Varian 3400 model). The gasoline produced is analyzed by Capillary Gas Chromatography (HP 5880 A). The weight of coke deposited on the catalyst is measured by an Elemental Analyzer (Leco CHN-800 model). Except for the MAT unit, the evaluation of the catalyst is completed by the physicochemical characterization using the following tests:

- Unit Cell Size (UCS)
- Surface area

- Surface area and pore volume
- Attrition index

Resistance of FCC catalyst to metals deposition

Oil refining industries are continuously looking for maximum efficiency within technical, financial and environmental requirements. In this respect the processing of residues and heavy components in the FCC unit is becoming increasingly important. However, these heavier feedstocks has as result the metals deposition on the catalyst and especially vanadium and nickel. This deposition occurs continuously during the cyclic catalyst process in the FCC unit (reaction-regeneration) and this result to accumulation of metals concentration on the catalyst. The heavy metals, Ni and V, poison the FCC catalysts. The V reacts with the zeolite and destroys it. The Ni changes the selectivity of catalyst and so FCC process produces more hydrogen and coke. To evaluate the importance of the above new concepts in FCC catalyst design, the performance of these catalysts should be examined under realistic deactivation and testing conditions.