



## **CATLAB**

### CATLAB Sample Size

#### **Summary**

Hiden's CATLAB microreactor is designed for catalyst characterisation, kinetic and thermodynamic measurements. A wide variety of samples can be analysed, but to get the best data, a proper appreciation of sample preparation and size considerations is essential.

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## Introduction

Hiden's CATLAB microreactor is a versatile instrument allowing a multitude of catalyst characterisation and reaction measurements to be performed. It is important that these samples are properly handled so that the CATLAB can obtain the best data.

At the heart of CATLAB is the catalyst cartridge system sample holder. This is a quartz glass tube with a hole in the end to allow gas flow. Once loaded, a thermocouple inserts into the sample to measure temperatures during the experimental run. Gas then flows around the thermocouple, through the sample and out to be analysed by Mass Spectrometer. See Figure 1 for a schematic.

The sample holder will accommodate most sample types. Typically samples are in the form of a powdered solid. Ideally a sample has mass 50-150mg, depending on sample density and a particle size of 250-500 $\mu$ m. However, a maximum of 500mg can be accommodated\*. This will allow the thermocouple to bed satisfactorily and give accurate temperature readings. Also a small mass of sample will allow good thermal conduction and effective gas adsorption and desorption. The catalyst bed should not be too deep to minimise the pressure drop through the catalyst. The Mass Spectrometer inlet is positioned for maximum sensitivity.

The sample tube slides into the same position in the reactor tube each time. Together with the bedding of the thermocouple, these two features ensure maximum reproducibility.

\*Standard sample tube. Optional large size sample tube can hold a maximum of 2.0g.

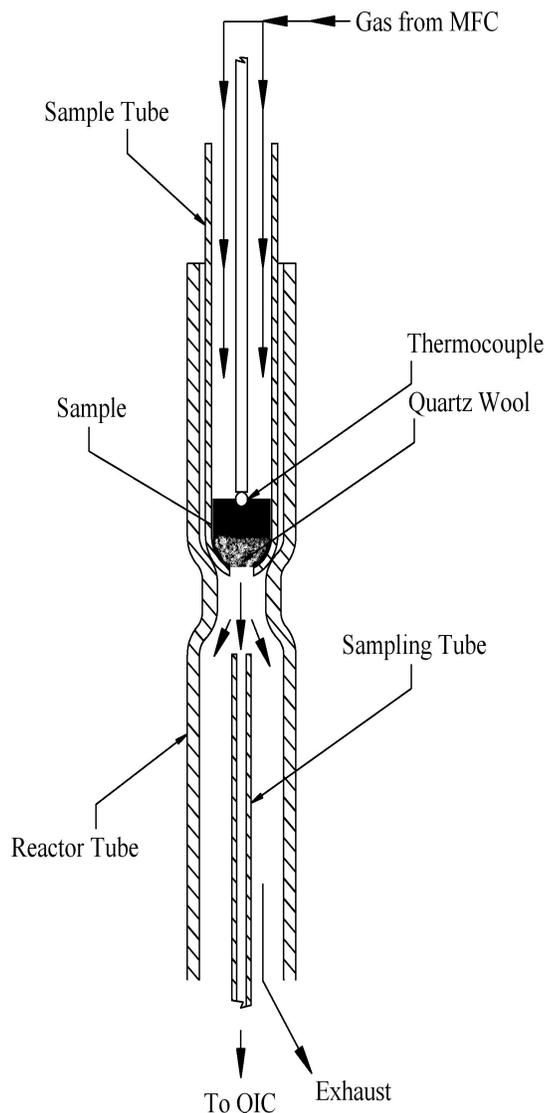


Figure 1: Drawing of CATLAB Sample Tube