Cost competitive “soft sensor” for determining product recovery in industrial methanol

The measurement of ratio of product recovery in industrial methanol distillation is of high economic importance and represent a key performance index (KPI) of the distillation unit. In current operations, the product recovery of many industrial distillation units are not actively monitored, instead back calculated from daily production reports. The active monitoring of product recovery can be a costly affair as it requires expensive gas chromatographs and accurate feed mass flow measuring devices to be installed. Historically, this has been one of the key reasons for not actively monitoring product recovery. In this work a novel, simple and economical method based on density and flow rate measurements to calculate the product recovery of industrial methanol distillation columns has been developed. This method has been validated against plant measurements as well as a validated process simulation. Step and disturbance tests carried out suggest the proposed method is able to accurately estimate the product recovery within the plant operational envelope, but lacks the ability to capture the process dynamics during process changes.