

Forecasting of corrosion rate in refinery plant using operational model

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Corrosion can give severe damage to equipments which finally causes failures despite its very slow chemical reaction. In refinery industry as a one kind of process industry, processes operate continuously for several years without shutdown. Since shutdown caused by failure associated with corrosion makes a great loss, managing the corrosion of equipments is one of the most important thing in refinery. In this study, corrosion forecasting models are developed based on plant operational data. Corrosion models in literatures are divided into two categories, electrochemical model based on experimental results under extremely controlled condition and mass transfer model with assumption that mass transfer of corrosive materials is slower than corrosion reactions. However, these models cannot be applied to the refinery plant because corrosion reactions are highly sensitive and many parts of the mechanisms are not discovered. So for these reasons, statistical approaches are applied such as multiple linear regression and artificial neural network. There are many limitations in the operational data due to the quality of the data and unmeasurable variables, thus additional statistical analysis are required.