

THE CHARACTERIZATION OF CRYSTALLINE DEPOSITS FROM THE FIELD BY QUANTITATIVE RIETVELD PHASE ANALYSIS

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ABSTRACT

In this paper, the authors report quantitative Rietveld phase analysis or weight percentage (wt%) for each of the identified crystalline phases of deposits from the field. The objectives of the study were to quickly, precisely and accurately identify the phases appear at the very tiny amount of the crystalline deposits that were build up in the specifics affected systems. Subsequently, when all of the phases were identified (finger prints or qualitative analysis), quantitative Rietveld phase analysis was used to determine of weight percentage for each of the identified phases. The results revealed that iron oxide corrosion products mainly present at the affected equipment in a refinery, which suggests that at low temperature the mostly formed and with time lepidocrocite iron oxide corrosion products transformed into most stable goethite phase, which is the other types of iron oxide corrosion products with a different crystal structure. Subsequently, iron sulfate corrosion products mainly appeared at the tiny crystalline deposits part collected from sulfur recovery unit. The findings help the field engineers and scientists in taking the right procedures on how to prevent the accumulated deposits at particular affected equipment.

KEYWORDS: *Quantitative Rietveld phase analysis, crystalline deposits, XRD*