

HYDROGEN SULFIDE SEPARATION FROM GAS STREAMS: SELECTIVE OXIDATION INTO ELEMENTAL SULFUR IN AQUEOUS SOLUTIONS OF IRON CHELATES.

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EXTENDED ABSTRACT

The present work concerns the investigation of the kinetics of H_2S selective oxidation into sulfur, in a wetted wall batch recycle reactor, by gas absorption with chemical reaction in $Fe^{3+}(NTA)$ aqueous solutions. The conversion of Fe^{3+} to Fe^{2+} was determined over the pH range ca. 3–6 and temperature range ca. 30–60°C. The *penetration theory* was employed for the evaluation of *intrinsic specific reaction rates* and *enhancement factors*. Activation energy values determined from the pertinent *Arrhenius* plots fall in the range, $E_a=17.2–22.8$ kcal/mol. These values compare satisfactorily with that of $E_a=24$ kcal/mol obtained from a similar kinetic study performed in a bubble column reactor and indicates a chemical reaction control of the overall gas absorption phenomenon. *Enhancement factors* varied as follows: $E = 2.7–7.5$ ($pH=3$), $E=3.2–14.1$ ($pH=4$), $E=5.9–17.0$ ($pH=5$), και $E=6.7–20.1$ ($pH=6$) indicating a substantial increase of the mass transfer coefficient due to chemical reaction.