

## **Experimental investigation of oxygen kinetic reduction by ferrous iron: the role of reactive oxygen species**

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Oxygen reduction by ferrous iron down to water involves four one-electron transfer step producing intermediate reactive oxygen species between each electron transfer. Determination of reaction rate constants of each reactive oxygen species (namely superoxide anion, hydrogen peroxide and hydroxyl radical) with ferrous iron varies from author to author and depends on the conditions/environments tested. This study presents a kinetic model describing each step of the oxygen reduction by ferrous iron based on the reaction rate constants found in the literature. An experimental verification of the published kinetic constants is attempted by measuring the different reactive oxygen species produced thanks to specific chemical quenchers. Role of bromide, nitrate and carbonate concentration are also described.