

Photodecomposition of water using Fe^{II}/Fe^{III} phosphates as an intermediate redox couple

K. Tennakone^a, W. D. W. Jayatilake^{a, b}, U. S. Ketipearahchi^a, W. C. B. Kiridena^a,
M. A. K. L. Dissanayake^{a, c} and O. A. Illeperuma^{a, d}

^a*Institute of Fundamental Studies, Hantana Road, Kandy (Sri Lanka)*

^b*Department of Chemistry, University of Sri Jayewardenepura, Nugegoda (Sri Lanka)*

^c*Department of Physics, ^dDepartment of Chemistry, University of Peradeniya, Peradeniya (Sri Lanka)*

(Received August 16, 1990)

Abstract

The UV photolysis of an aqueous solution of iron(II) phosphate (pH ≈ 2.2) liberates hydrogen at a rate faster than other iron(II) solutions at a similar pH, due to removal of the reaction product Fe³⁺ as insoluble iron(III) phosphate. An aqueous suspension of iron(III) phosphate ground with TiO₂ liberates molecular oxygen with reduction of iron(III) phosphate to iron(II) phosphate. The possibility of water photodecomposition using the above reactions is discussed.