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Radical Water Activation and Hydrogen Atom Transfer to π -Systems



We demonstrate water activation by a photocatalytic phosphine-mediated radical process, generating a $\text{PR}_3\text{-H}_2\text{O}$ radical cation intermediate, where both hydrogen atoms are used in the following chemical transformation through sequential cleavage of the O-H bonds.¹ We will show how phosphoranyl radicals can be turned into super electron donors.² Moreover, P-radical cations can also be used for activation of nitroarenes³ and it will be discussed that nitroarenes are radical oxygenation reagents for Fe-catalyzed alkene hydrations.⁴ Further, a new radical amidation reagent is introduced and applications for the hydroamidation of complex alkenes will be demonstrated.⁵ Finally, Fe-catalyzed hydrohalogenations of alkenes are discussed.⁶

References

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