

# **The Hydrogen Atom – Little but Very Important Protagonist in Chemistry and Biochemistry**

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Notwithstanding its very small size, the hydrogen atom and its nucleus play gargantuan roles in chemistry and biochemistry. The covalently linked hydrogens form large number of H-bonds in sizeable (bio)molecules, liquids and molecular solids, thus significantly affecting their structures and properties. The proton is the protagonist in the acid-base chemistry. It is transferred from an acid to a base by breaking one covalent bond to the hydrogen atom in the former and creating another in the latter. A brief overview of the results will be given obtained in tailoring strong organic superacids and superbases by employing the methods of computational chemistry, which in turn have been guided by simple concepts. A relation between the conceptual and computational quantum chemistry will be discussed in some detail within this context. Finally, the importance of intramolecular hydrogen bonds in alpha – amino acids and their protonated and deprotonated forms will be emphasized and documented by some interesting examples.