

Working Partial Pressure of CO₂ in Aqueous Solution

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Carbonate species in aqueous solution play an important role in the determination of chemical properties of water in relation with alkalinity, buffer capacity, biological productivity, and so on. These compounds also have reactive characteristics such as interphasal reactions between solid, liquid, and gas phases. In the absence of solid materials, the total amount and relative abundance of each carbonate species are directly influenced by the partial pressure of CO₂ gas in the atmosphere, which in turn significantly affects the properties of aquatic system. To understand the fundamental aspect of the relationship between the partial pressure of CO₂ gas and chemical features of water, especially pH, the working partial pressure of pure CO₂ gas that produced by contacting the dry ice with water has been estimated based on equilibrium calculation. The estimated working partial pressure of pure CO₂ gas was found to be a function of the concentration of carbonates in solution, which suggesting that prior evaluation of the working partial pressure of gas is essential for a better understanding of aquatic interactions.