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Ammonia is a natural and common nitrous agent affecting all vital processes in animal, plant and bacterial cells. In organisms, it is produced by about two hundred enzyme reactions, thus being an essential and harmless metabolite. At high concentrations, ammonia becomes a strong toxin. In this book, the authors present current research in the study of the structure, biosynthesis and functions of ammonia. Topics include the biochemical studies on energy metabolism in animals in acute ammonia intoxication; development of distributed fiber optic sensors of ammonia gas; inhibition of rRNA synthesis by amines and ammonium ions in xenopus embryos; amino acids that play roles in plant adaptation to abiotic stress and the atmospheric concentration of NH3, NO2, HNO3 and SO2 by the passive method compared with corresponding emission inventory.