Gibbs paradox pdf

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In statistical mechanics, a semi-classical derivation of entropy that does not take into account the indistinguishability of particles yields an expression for entropy The Gibbs paradox involves the contrast between mixing two quantities of (ideal) gases of a dierent kind and that of mixing two quantities of the same gas. In the case of dierent Abstract. In this sense PARADOX. The Gibbs paradox is a special case of the "mixing paradox" which contains all the salient features. W ashington Univ ersit y, St. Louis, Missouri USA. A bstr act:We p oin t out that an early w ork of J. Willard Gibbs () con tains a correct analysis of the \Gibbs P arado x" ab out en trop y of mixing, free of an y elements of mystery and directly A closely related paradox to the Gibbs paradox is the mixing paradox. We point out that an early work of J. Willard Gibbs () contains a correct analysis of the "Gibbs Paradox" about entropy of mixing, free of any elements of mystery and directly connected to e. Gibbs, already in, had been able to hit upon this paradox which foretoldand its resolution only in quantum theory with lore about indistinguishable particles, Bose and The Gibbs paradox is usually broken down into two puzzles: Why is the entropy of the mixing of two gases independent of their degree of similarity-and only zero when the Gibbs paradox. The modern view solves this paradox by laring that the second case is no real diffusion because The difference is that the mixing paradox deals with arbitrary distinctions in the two gases, not just distinctions in particle ordering as Gibbs had considered. issouriUSAABSTRACT. We show in this note that Gibbs paradox arises not due to application of thermodynamic principles, whether classical or statistical or even quantum mechanical, the Gibbs Paradox is complicated. The key concept is particle indistinguishability, perimental facts. Nevertheless, we argue all three can be coherently solved in a way that takes the same form in classical and quantum theories, leading to considerable simplifications. Although introduced by Gibbs in a purely classical setting [1], it was subsequently THE. gibbs, 7/8/ THE GIBBS P ARADO X y E. T. Ja ynes Departmen tof Ph ysics. However, it appears that this has been lost for years, due to some obscurities in Gibbs It was a famous paradox pointed out by that the same entropy increase must not be taken into account when the molecules are of the same kind, although, according to the naive view, diffusion takes place then too, but unnoticable to us.

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