Equilibrium partitioning of organic compounds

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Question 12

12 a) In a restaurant, a colleague of mine ordered still (i.e., non-carbonated) mineral water. Then he turned to me with a smile on his face and said: "I wonder whether they will manage". Why was he wondering?

Answer: Ambient air contains CO_2 . Thus, water that is in contact with ambient air will inevitably also contain some CO_2 (although not enough to make it sparkling) and it would be quite an effort to remove it.

12 b) What can one conclude from the fact that CO₂ spontaneously starts to bubble out when a bottle of sparkling water is opened. And what does that mean for the CO₂ concentration in the gas phase of the bottle before it was opened?

Answer: Apparently, the water was oversaturated with CO_2 with respect to the atmospheric concentration of CO_2 . The CO_2 concentration in the gas phase of the bottle before it was opened was much higher than in ambient air because it was most likely in equilibrium with the water phase.

12 c) How could all CO_2 be removed from the water?

Answer: The most efficient way to remove all CO_2 is to bubble a gas that does not contain any CO_2 (e.g. pure nitrogen) through the water.



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