

Title Absorption kinetics of oxygen and carbon dioxide scavengers as part of active modified atmosphere packaging

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Abstract

Absorption kinetics of two commercial O₂ and CO₂ scavengers commonly used in active modified atmosphere packaging (MAP), were studied. Individual scavenger sachets were placed in polyvinylidene chloride pouches filled with air or modified atmosphere at 0% or 100% relative humidity and at 5, 20 and 35 °C. The headspace gas composition was measured as a function of time. Absorption kinetics were described by a first-order reaction with an Arrhenius type behaviour. The absorption capacity, absorption rate constant, energy of activation, Arrhenius constant and variation of all these parameters were evaluated and discussed. Significant “parasite” CO₂ absorption was observed for O₂ scavengers. This study also underlined the need to take into account the important variation of absorption rate constant (about 20%) among individual gas scavengers and the temperature effect for reliable evaluation of the gas kinetics when using O₂ or CO₂ scavengers in an expected and secure way.