

Abstract

Sorption isotherm experiments in the high RH range (80–100%) were carried out at 1, 6.5, 10.5 and 18.5 °C for different parts (inner cortex, outer cortex tissues and cuticle) of early and late picked ‘Conference’ pears after 1 and 6 months of storage in controlled atmosphere conditions. Experiments were implemented successfully with the pressure-controlled method, in which samples were submitted to an air-flow of very high velocity (≈ 10 m/s) for 48 h. The results showed no significant effect of picking date and storage period. The effect of temperature was evident in the RH range above 91% for the inner cortex tissue, but much less for the outer cortex tissue. The difference in sorption isotherms of different tissues is quite obvious. The cuticle showed a non-hygroscopic behaviour, while the inner and outer cortex tissues showed the opposite. The inner cortex tissue had a higher water holding capability than the outer cortex tissue, which indicates the more protective properties of the latter against temperature and relative humidity fluctuations during storage. The water content change versus water activity was also stronger in the case of inner cortex tissue. In an attempt to relate the moisture distribution (water content) to the water status (potential) in pears and, to understand water movement in fresh fruit, a detailed modelling of the cellular structural properties and of the intercellular space is a necessity.