Abstract:

A model for simulation of dynamic processes in controlled atmosphere cool rooms is presented. The model allows prediction of transient behaviour of temperature, humidity and gas composition (CO_2 & O_2). Several modules representing each of the components in a cool room were developed based on energy and mass balances. These sub-models were then interconnected to form a global cool room model. The production of CO_2 and the consumption of O_2 is accounted for by including a respiration model. The heat generation by respiration is computed based on the production of CO_2. Simultaneous simulation of several cool rooms (CA) loaded with different products is possible, which enables to predict the actual total load imposed on the refrigeration plant. The model allows tuning of control parameters to improve performance of the cool rooms. Due to the modular and object-oriented approach greater flexibility with respect to model modification is achieved. In this work the model was validated for an empty cool room. In a next step the model will be validated for a loaded cool room.