

**Title** Assessment of the diffusion model for drying using a state-observer based process  
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### **Abstract**

The problem of determining the constancy of the diffusion coefficient, or its dependency on moisture content, from observations of moisture content during the course of the drying is addressed. The method employed departed from the usual finite dimensional model representation of the drying process, a truncated Fourier series solution to the diffusion equation, where the possibility of determining the diffusion coefficient from drying kinetics data is assessed. In this work, a state-observer based estimation process was implemented to identify the diffusion coefficient using the moisture content measurements and their time-derivatives. Two examples using simulated data were chosen to set up a criterion for discrimination purposes, and the developed technique was applied to two sets of experimental data. The results obtained showed that: (i) the diffusion coefficient dependency on moisture content could be uniquely determined, (ii) modelling discrimination can be performed and, (iii) the functional dependency of moisture content can be determined and not assumed, as previously.