

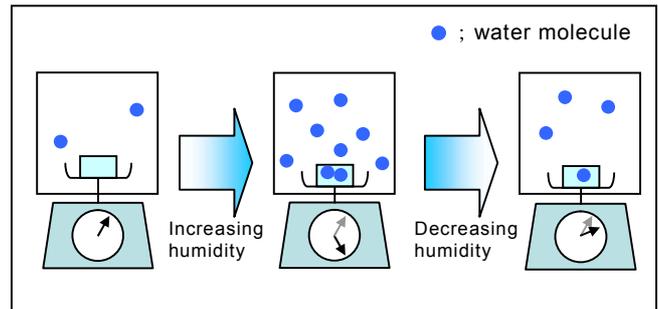
● Evaluation of moisture sorption property

TNE0009

Overview

Water is a molecule consisting of one oxygen and two hydrogen atoms. It has particular features deriving from the great strength of the hydrogen bonds, which have a considerable effect on mass transfer and physicochemical reactions. Thus establishing the sorption properties of water in materials is very important in analyzing the performance of all kinds of organic, inorganic and polymer materials and drugs and catalysts etc.

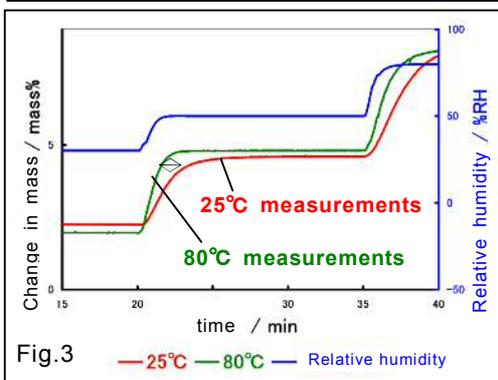
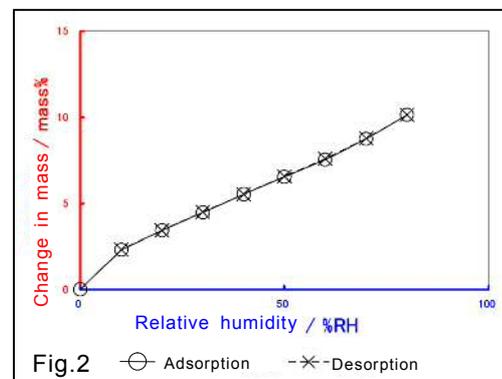
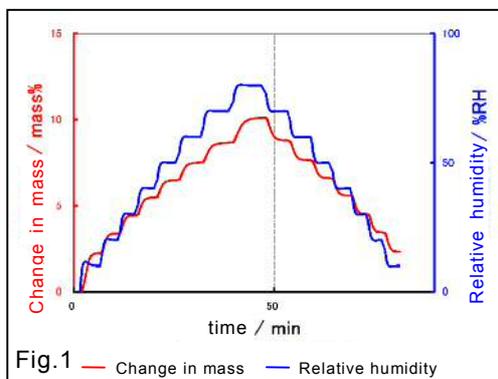
One method of evaluating the sorption properties of water in materials is to hold the temperature of the sample constant while varying the surrounding humidity, and measuring the changes in mass. By continuously monitoring the changes in mass, it is possible to measure not only water adsorption in the equilibrium state but also the sorption properties in transient states.



Examples: Evaluation of moisture absorbance of polymer film

The sample was maintained at a constant temperature, and humidity was varied from 0% → 80% → 10% (10% range of variation in humidity), and the sample moisture absorbance was measured.

In this sample, changes in mass followed closely on changes in humidity (Fig. 1) and the sorption histogram was also very low (Fig. 2).



The polymer film from Fig. 1 and 2 was also evaluated for moisture absorption behavior under different temperature regimes (Fig. 3). The results show that the amount and rate of change in mass was greater at the higher temperature (80°C) than at the lower (25°C), and thus the velocity and amount of moisture absorption were higher. Created by SCAS: <https://www.scas.co.jp/technical-informations/technical-news/pdf/tn344.pdf>

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