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## Measuring water vapor permeation for food package materials using cavity ring-down spectroscopy

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One of the critical factors in the choice of food packaging materials is moisture permeability which is important for maintaining product quality. Various type of barrier-coated polymer films are being used to package many different food products. A continuing trend of food packaging is to extend the shelf life of food while maintaining fresh-like quality. KRISS has been operating a measurement system for moisture permeation using water including tritium since 2009. Its detection limit reach to  $10^{-7}$  g/m<sup>2</sup>day. However, it is difficult to utilize it for general purpose because tritium is a radioactive isotope. Therefore, we have established another method for measuring water vapor permeation in a range  $10^2\sim 10^5$  g/m<sup>2</sup>day by using Cavity Ring-Down Spectroscopy (CRDS). The accuracy is improved by low-flow gas feedback circuit with low-pressure, and controlling the adsorption/desorption periodically. This method provides absolute quantitative measurement, which has a traceability to national standards. The uncertainty of the CRDS-based measurement device was about  $1\times 10^{-5}$  g/m<sup>2</sup>day.

### Biography

Byung I L Choi received his PhD degree from the Department of Physics in Korea University in 2003. Since 1990, he has been working at Thermometry Center in Korea Research Institute of Standards and Science (KRISS). His main research areas are humidity/moisture standards, water vapor permeation, physical adsorption and specific surface area of non material.

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