A comparative study of oxygen transmission rates through polymer films based on fluorescence quenching - DTU Orbit (30/09/2019)

**A comparative study of oxygen transmission rates through polymer films based on fluorescence quenching**

Information on oxygen permeability through polymer films is essential for some applications, especially in food packaging where the control of oxygen levels can be critical in avoiding food spoilage. A permeability testing device using fluorescence-based optical oxygen sensing was developed as a potential new instrument for measuring the oxygen permeability of packaging films. The fluorescence-based permeability tester was validated against two existing commercial oxygen permeability measuring devices, the Mocon Ox-Tran 2/20 and PBI-Dansensor OPT-5000. Oxygen transmission rates (OTR) of polylactide (PLA) and nanoclay-reinforced PLA films, as well as polyethylene/poly(ethylene terephthalate) (PE/PET) and polypropylene/poly(ethylene terephthalate) (PP/PET) laminated films were determined at 23°C and 50% relative humidity using each of these instruments. No significant differences were observed between mean OTR values obtained by the fluorescence method and the corresponding values obtained using the OPT-5000 but significantly lower values were measured when using the Mocon Ox-Tran 2/20. In general, oxygen permeability data for the tested films were within the range of values found in the literature; however, in terms of further development, the fluorescence-based technique gave OTR with relatively high standard deviation compared to the commercial methods and equipment modifications to address this issue are considered desirable. Copyright © 2010 John Wiley & Sons, Ltd.

**General information**
Publication status: Published
Organisations: Solar Energy Programme, Risø National Laboratory for Sustainable Energy
Contributors: Siró, I., Plackett, D., Sommer-Larsen, P.
Pages: 301-315
Publication date: 2010
Peer-reviewed: Yes

**Publication information**
Journal: Packaging Technology and Science
Volume: 23
Issue number: 6
ISSN (Print): 0894-3214
Ratings:
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.722 SNIP 1.172
Web of Science (2010): Impact factor 1.434
Web of Science (2010): Indexed yes
Original language: English
Keywords: Biopolymers, Solar energy
DOIs:
10.1002/pts.895
Source: orbit
Source ID: 268442
Research output: Contribution to journal › Journal article – Annual report year: 2010 › Research › peer-review