

Water Vapor Sensors Based on the Swelling of Relief Gelatin Gratings

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Advances in Materials Science and Engineering. Vol. 2015, Article ID 584324

Abstract

We report on a novel device to measure relative humidity. The sensor is based on surface diffraction gratings made of gelatin. This material swells and shrinks according to the content of water vapor in air. By sending a light beam to the grating, diffracted orders appear. Due to the gelatin swelling or shrinking, first order intensity changes according to the relative humidity. Calibration curves relating intensity versus relative humidity have been found. The fabrication process of diffraction gratings and the testing of the prototype sensing devices are described.