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Highly Sensitive and Wide-Dynamic-Range Side-Polished Fiber-Optic Taste Sensor

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Research Highlights Proposed a highly sensitive side-polished fiber-optic taste sensor.

- Based on the optical-fiber intensity modulation technique.
- Fast response about 90 s with highly stable sensing performance.
- Linear sensing response over a wide dynamic range.

Abstract

In this study, we have developed a highly sensitive, side-polished optical fiber sensor, which is widely used as the primary sensing device in many applications, to detect low concentrations of taste substances. The working principle of the proposed sensor is based on the intensity modulation principle. In our experiment, a sensing membrane was coated on the surface of a single-mode side-polished optical fiber by incorporating six different solvatochromic dyes, polyvinyl chloride, and N,N-dimethylacetamide. When the sensing membrane of the sensor contacts the taste substances, the refractive index of the planar waveguide changes owing to the change in the transfer band of

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