

Development of A Novel Solid-State pH Sensor Based on Tin Oxide Thin Film

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Z. Naturforsch. **59b**, 877 – 880 (2004); received December 15, 2003

A solid-state pH sensor was fabricated using a transparent conductive tin oxide film on a glass substrate. The coating of the glass substrate was achieved by a novel simple chemical vapor deposition (CVD) procedure. The response time of the pH sensor was substantially reduced when a thin graphite film was deposited onto the tin oxide conductive film. The sensor slope was found to increase as the temperature of the solution was increased. The performance of the sensor was investigated in the pH range from 0.3 to 11.0. A straight-line calibration graph was achieved throughout the whole range tested, especially when the solution temperature was 80 °C. The working pH range was found to decrease on the expense of the lower range as the temperature was decreased. Results obtained by the suggested sensor compares very well with conventional pH electrodes where the square of the correlation coefficient was 0.999.

Key words: pH Sensor, Tin Oxide, Conductive Thin Film