Hydrothermal Synthesis of Li_2TiO_3 Powders

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In recent years there has been an increased interest in monitoring and controlling such constituents of engine exhaust as O_2, CO, CO_2, NO_x, and hydrocarbons. Li_2TiO_3 is used as cathode material in carbon dioxide sensor, anode material in lithium ion batteries and tritium breeder materials in the blanket of fusion reactors. Carbon dioxide sensors are becoming increasingly important for many applications, such as monitoring air quality and controlling combustion. The CO_2 detection approach uses an electrochemical cell with lithium (Li)-based electrolyte whose voltage output depends on the CO_2 concentration in the environment. A solid potentiometric CO_2 gas sensor has been developed using Li_3PO_4 as the electrolyte, Li_2TiO_3/TiO_2 as the reference electrode, and Li_2CO_3 as the sensing electrode. The basic sensig mechanism is to measure the equilibrium potential difference between sensing and reference electrodes. Li_2TiO_3/TiO_2 enables this senser to avoid oxygen interference. In this study, Li_2TiO_3 powders were prepared by the hydrothermal method with TiO_2 and LiOH. The phase presence and surface morphology were characterized by XRD and SEM techniques, respectively.