

A study on recoverable SnO₂-based semiconductor gas sensor for DMMP

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The dimethyl methyl phosphonate (DMMP), an organophosphorous compound is widely used as the simulant agent for the chemical warfare agent. In this study, thick-film sensors were fabricated by screen-printing technique using the physical mixtures of the SnO₂ and various metal oxide powders. The electrical properties of sensors such as sensitivity, response time and recovery were tested in the flow system at 350°C. Comparing with the conventional SnO₂ gas sensor, the new SnO₂-based gas sensors promoted with molybdenum oxide and antimony oxide showed an improved sensitivity to the DMMP and they were completely recovered after detection, although their recovery rate was slow. Other SnO₂-based gas sensors promoted with various metal oxides for improving the sensitivity were not recovered after severe conditions. Their sensitivities and recoveries depend on the amount of the molybdenum oxide and antimony oxide.