

### A study on the tin oxide-based semiconductor gas sensors for the detection of chemical agent simulants

이우석, 박정제, 전희권, 이수출, 최낙진<sup>1</sup>,  
이덕동<sup>1</sup>, 백원우<sup>2</sup>, 허증수<sup>2</sup>, 김재창\*  
경북대학교 화학공학과; <sup>1</sup>경북대학교 전자전기공학부;  
<sup>2</sup>경북대학교 금속공학과  
(kjchang@bh.knu.ac.kr\*)

A semiconductor gas sensor based on tin-oxide was studied for detecting chemical agent simulants such as DMMP, DPGME, acetonitrile and dichloromethane. The thick-film gas sensor was fabricated by screen-printing technique. The electrical properties of the sensors, such as sensitivity, response, recovery and reproducibility were investigated in the flow system. The sensitivities of the sensors linearly increased with the concentration of acetonitrile from 0.02ppm to 0.2ppm. In the cases of other gases the sensitivities increased linearly from 0.1ppm to 0.5ppm. Detecting limit was 0.02ppm. A complete reproducibility of the tin oxide based sensor seemed to be possible for DPGME and acetonitrile. However, in the case of DMMP and dichloromethane, recovery of the sensitivity was not complete after regeneration in air because of poisoning effect. Pt-doped tin oxide sensor showed higher sensitivity(70%) to acetonitrile than that of tin oxide at 250°C, whereas they showed similar sensitivities at 350°C.