# Sensing behaviors of $SnO_2$-based thick film gas sensors promoted with metal oxides for the detection of chemical agent simulants of ppb level

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The sensing behaviors of $SnO_2$-based thick film gas sensors were investigated under very low concentrations (ppb level) of chemical agent simulants such as DMMP (dimethyl methylphosphonate), DCM (dichloromethane), DPGME [di(propylene glycol) methylether], and acetonitrile in a flow system. In the cases of acetonitrile and DPGME, the $SnO_2$ gas sensor showed a complete recovery, as well as a good sensor response. On the other hand, in the cases of DCM and DMMP, this sensor did not recover after the detection of these gases. $SnO_2$-based gas sensors promoted with $MoO_3$, NiO or $Sb_2O_3$ showed not only the good sensor response, but also the excellent recovery for the detection of DCM and DMMP. In particular, the responses of these sensors were maintained during multiple cycles of detection and recovery.