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Analysis of desorption species from MOS structure surfaces induced by gate voltages NOZOMU HIROTA, KEN HATTORI, HIROSHI DAIMON, Nara Inst of Sci & Tech — Hot carriers, which have energies over the Fermi level, are able to activate surface reaction. A MOS structure is able to generate tunable hot carriers under gate bias-voltages, would be suitable for the hot-carrier injection to surface from the metal side, but not vacuum side. In this research, I desire to make a proposition of catalytic devices using MOS structures. Desorption is one of the important paths in catalytic reaction, and would be observed when the bais-voltage is applied. We found desorption on N_2O exposed MOS ($Fe/SiO_2/p$-Si) structure, detected by a mass spectrometer. The desorption were observed only when the metal surface was in negative polarity, the hole injection. The desorption of CH_4 molecules was confirmed by mass analysis with cracking corrections. Since non-polar molecules (e.g., CH_4) are hard to adsorb, the origin of CH_4 is not adsorbed one as the molecule, but the catalytic reaction. At the same time, NH_3 and H_2O background intensities decreased. We consider the following scenario. The CH_4 is generated from CO and adsorbed H over Fe_xN_y/SiO_2 surface with hot-carrier activation. The CH_4 formation inhibit H_2O and NH_3 suitable generation via decrease adsorbed H concentration. Most of desorption species can be expl

Nozomu Hirota
Nara Inst of Sci & Tech

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