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**STM/STS Study of Surface Modification Effect on Bandgap Structure of $Ti_2C$ with -OH, -F, and -H.**[1] SEONG JUN JUNG, SHEN LAI, TAEHWAN JEONG, SUNGJOO LEE, YOUNG JAE SONG, Sungkyunkwan Univ — In this presentation, we present Scanning Tunneling Microscopy (STM) and Spectroscopy (STS) study of bandgap structures of surface-modified $Ti_2C$ with -OH, -F, and -O in atomic scale. Since the discovery of new two dimensional (2D) materials like graphene, various 2D materials including transition metal dichalcogenide (TMD) have been intensively investigated. There are, however, still scientific issues to apply them to the device fabrications for controlling the appropriate bandgap structure with high field effect mobility. Recently another 2D materials of transition metal carbide (TMC), $Ti_2CT_x$ with modifiable surface group $T_x$ (-OH, -F, and -O) was suggested. [S. Lai et. al, Nanoscale (2015), DOI: 10.1039/C5NR06513E]. This 2D material shows that the mobility at room temperature is less sensitive to the measured transport bandgap, which can imply that $Ti_2CT_x$ can be a strong candidate of 2D TMC for application to the future electronic devices. Surface modification on the electronic structure of $Ti_2C$ by -OH, -F, and -O is, therefore, investigated by STM and STS in atomic scale. More scientific results will be further discussed in the presentation.

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