

## **Keynote: Multifunctional EMI Shielding and Sensor Applications with 2D Materials and their Composites**

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### **ABSTRACT**

Two-dimensional (2D) materials and their composites have attracted widespread attention for many electronic applications. Combining 2D materials with other nanomaterials to form multifunctional composites is necessary to enhance the performances and add more functions to realize various applications. As electromagnetic (EM) wave pollution is becoming more and more severe due to the development of high-speed wireless communication devices and systems, researchers are trying to find suitable materials to prevent electronic devices from interrupting each other. 2D transition-metal dichalcogenides (TMDs) with their unique properties are also of great interest as sensing materials for the development of sensors with exceptional sensing performance. Herein, I introduce recently developed multifunctional composites based on 2D materials for flexible pressure-temperature sensors with ultrahigh gamma radiation tolerance and an artificial electronic skin film with ultrahigh EMI shielding effectiveness (SE) and strain-pressure sensing performance. I also demonstrate resistive type 2D TMDs-based thin film humidity sensors with

superior humidity sensitivity and fast response based on 2D molybdenum disulfides (MoS<sub>2</sub>) and platinum diselenide (PtSe<sub>2</sub>).

### **Acknowledgement**

This work was supported by Korea Institute of Energy Technology Evaluation and Planning (KETEP) grant funded by the Korea government (MOTIE) (20181510102340), and Korea Evaluation Institute of Industrial Technology (KEIT) grant funded by the Korea government (MOTIE) (20013138).