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Samsung Develops X-Ray Detector Material with Low Radiation Exposure

New cost-effective perovskite semi-conductor material, developed with Sungkyunkwan University, is 20 times higher in sensitivity for X-rays, with 1/10th of typical radiation exposure*

Seoul, KOREA – **October 12, 2017** – Samsung Electronics Co., Ltd. today announced that the Samsung Advanced Institute of Technology (SAIT), in collaboration with Sungkyunkwan University in Seoul, Korea, has developed a detector material that decreases radiation exposure to less than 1/10th of the normal amount typical for medical X-ray imaging such as fluoroscopy, digital radiography, CT, and other radiology equipment.

The research findings were published in the October 4, 2017 edition of the scientific journal *Nature* in an article entitled "Printable organometallic perovskite enables large-area, low-dose X-ray imaging."

Researchers at SAIT developed a perovskite semi-conductor material that, in addition to being significantly lower in radiation, is 20 times higher in sensitivity for X-rays, as well as cheaper in price compared to conventional flat panel detectors. Additionally, while conventional detectors processed with a vacuum deposition process, the technology used to make thin films of semi-conductors, do not allow extension to a large area due to technical limitations, the new material allows enlargement as required through a solution-based process such as printing or bar coating. Commercialization of this technology offers the potential for producing low-dose X-ray detectors that can scan the whole body at once.

"In order to apply perovskite onto X-ray photons, which are highly penetrable, the material must be 1,000 times thicker than that of a solar cell, while being able to retain electric signals for a sufficiently long enough time converted from X-ray," said InTaek Han, Vice President of SAIT. "The new method of synthesis developed from the research is a key breakthrough for the field."

**Perovskite: This crystal structured mineral is named after the Russian scientist Lev Perovski. Developers of solar cells and X-ray equipment are highly interested in the material due to its excellent photoelectric efficiency, which transfers light into electrical current.*

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