Monday Morning, July 30, 2018

Plenary Session
Room Grand Hall A - Session PS1-MoM

ALD Plenary Session

Moderators: Jin-Seong Park, Hanyang University, Han-Jin Lim, Samsung Electronics, Hyun-Chul Choi, LG Display

8:30am **PS1-MoM-2 Evolution of Memory Technology and Future Scaling Challenges***, Seung Ho Pyi,* SK Hynix, South Korea **INVITED**

In the ever-changing world of ICT, due to the emergence of Internet of Things (IoT), big data, and the cloud, demand for Memory IC is growing exponentially. Therefore, in this session, development trend of two memory Ics, DRAM and NAND Flash memory, and the role of key technologies, ALD in particular, in the development of Memory IC will be discussed. In both DRAM and 3D NAND, technologies have continued to drive innovation. In DRAM, a remarkale progress has been made in technologies related to spacer pattering, cell transistor, and high-k cell capacitor. In 3D NAND, to overcome the challenge of stacking multiple layers, technologies related to etching holes/lines with high aspect ratio, increasing channel mobility, and achieving device reliability were developed. In developing such innovative technologies, ALD processes for SiO_2, high-k dielectric and metal made a considerable contribution, and the need for ALD processes for various materials is expected to rise. Currently, continued scaling is expected to be increasingly difficult as manufacturing processes become more difficult and manufacturing cost increases due to the rising number of process steps and decreasing equipment throughput. Therefore, considering such scaling challenges, productivity enhancement should be incorporated into developing current and future ALD technologies.

9:30am **PS1-MoM-6 A Road to Damascus, ALD Technology***, Jinsung Chun,* Wonik IPS, Republic of Korea **INVITED**

Semiconductor industry is at the point of the big conversion. It is crucial to find the right path to reply to market needs. Through a series of analysis on the evolution of patterning technology, new materials, and device structure it was reached to the conclusion that future scaling will be driven by the transition to complete vertical structure in conjunction with the geometrical scaling and new materials. Moreover, ALD technology will play a key role in the 3D structure fabrication and new material process. Wonik IPS, one of the frontiers of ALD equipment, has been focusing on ALD technology development since the successful introduction of high-volume-manufacturing ALD system in 1996. We are ready to provide various ALD solutions and try to do the right thing right for new ALD era.

Plenary Session
Room Grand Hall A - Session PS2-MoM

ALE Plenary Session

Moderators: Geun Young Yeom, Sungkyunkwan University, Korea, Ankur Agarwal, KLA-Tencor

10:45am **PS2-MoM-11 Learning from ALE Mechanism Researches and Considerations for Future Demands***, Masayuki Tomoyasu,* Samsung Electronics Co., Inc. **INVITED**

There are continuously many challenges in dry etching process for Semiconductor device manufacturing such as High Aspect Ratio Structure Etching, Precise control of depth loading, Highly selective etching, LER/LWR minimization, Etching damage reduction, and so forth. ALE(Atomic Layer Etching) technology can relax a part of burden of the challenges.

Furthermore, mechanism analysis of ALE will also help understanding conventional etching processes. That will enlighten or emphasis necessity of even deeper understanding of plasma physics/chemistry and demand more precise design and control of plasma etching equipment as well. Several expectations from industry to academy to address future demands will be discussed.

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