For Immediate Release

High-K Precursors for ICs to Reach ~$400M by 2020

Details Presented at Critical Materials Conference in May 2016

San Diego, CA, April 18, 2016: Chemical precursors (inorganic and organic) used to form high dielectric constant (High-K) materials, metals and metal nitrides needed in advanced ICs are forecasted to reach **$400M USD in global sales by 2020,** as highlighted in **TECHCET's 2016 Critical Materials Report**. Estimated to have totaled over $258M in 2015**,** this market consists of ~51% high-k metal precursors used for gate dielectrics and capacitors, and ~49% other metal precursors used for electrode and interconnect processes.

The largest usage for High K ALD and CVD (Atomic Layer Deposition and Chemical Vapor Deposition) precursors will continue to be capacitor formation for volatile memory devices through 2020. However, it is expected that revenues for High-K gate oxides processes may surpass memory capacitors by 2021. Compared to CVD, the ALD process relies on unique properties of precursors to self-limit reactions at the atomic level, so ALD precursors are generally chemically engineered complex molecules that command relatively higher average selling prices.

Atomic Layer Etching (ALE) is a new technology similar to ALD, in that alternating sequential surface-limited steps remove precise layers. When engineering atom-scale device features, chip fabricators will continue to rely on such high precision processes employing new and existing materials to enable high quality surfaces. Besides the physical plasma assisted path to ALE employing Cl2 and Ar ions, the chemical path to ALE uses metal organic compounds and hydro fluoric acid, and recent research is focused on using tin(II) acetylacetonate and other beta-diketonates.

Understanding the complex dynamics of materials interactions are critical to the successful use of novel processes and materials in IC HVM. Challenges and opportunities relating to the affordable, controllable, and safe implementation of new materials will be presented in detail at the **Critical Materials Conference 2016**—open to the public May 5-6, in Hillsboro, Oregon—in conjunction with the private Critical Materials Council (CMC) meetings. ***For more info on TECHCET's Report or to Register for the CMC Conference, please go to www.cmcfabs.org/seminars/ or contact cmcinfo@techcet.com***

About TECHCET CA LLC

TECHCET's work is focused on process materials supply-chains and materials technology trends for Semiconductor, Display, Solar/PV, and LED manufacturing industries. The company has been responsible for producing the Critical Material Reports for SEMATECH and the industry since 2000. This work continues to benefit the Critical Materials Council, now organized as CMC Fabs. For more info please go to: www.cmcfabs.org or www.techcet.com

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