

20 June 2006

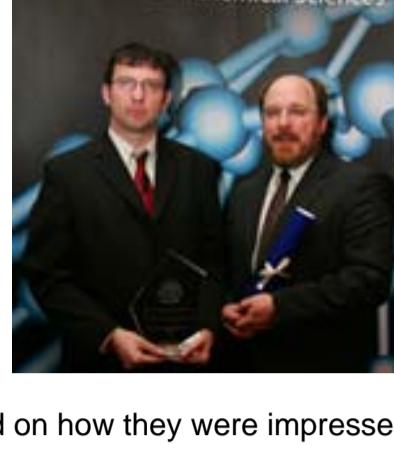
Dear user

Welcome to our latest electronic edition of Epichem News. We invite you to forward this message to any interested parties at your workplace and encourage them to sign up to receive a copy directly in the future.

Teamwork Award

Epichem is proud to announce that it has been awarded a prestigious teamwork award by the Royal Society of Chemistry for its collaborative research with Liverpool University.

The RSC Teamwork in Innovation 2006 award was judged on interactions between industry and the academic sectors that have successfully enhanced the state-of-the-art and can be exploited commercially. Epichem has worked extremely closely with Profs Tony Jones and Paul Chalker and Dr Helen Aspinall in the Chemistry and Materials Science Departments on the topic of novel precursor development for CVD/ALD of hafnium and rare earth oxides. A new range of products, suited to the growth tools, that produce excellent quality films was demonstrated and is currently being introduced to the semiconductor market commercially. The Award ceremony was held in London at RSC headquarters with Paul Chalker (Liverpool) and John Roberts (Epichem) accepting the prize as pictured. The judges commented on how they were impressed with the multi-disciplinary nature of the collaboration.



<http://www.rsc.org/ScienceAndTechnology/AwardsAndFunding/Innovation/teamwork.asp>

EpiFlux™ Solid TMI Bubblers



The demand for stable output from a solid TMI bubbler throughout its lifetime is of critical importance to high volume production processes. With the move to larger batch sizes, and therefore increased container volumes, innovative, superior designs must be employed to maximise performance. Epichem are at the forefront of TMI delivery systems and have developed a new design of container to afford outstanding flux control and reduced precursor residues. The EpiFlux™ bubbler combines a number of advantageous concepts in a proprietary fashion such that in customer trials significant improvements in process stability and yield were observed compared to alternative designs running under the same conditions. Specifically suited to 300-400g fill for use at 300mbar using flows 400-800scm, the EpiFlux™ bubbler ensures reliable In fluxes. Furthermore the weight of residual TMI

in returned EpiFlux™ bubblers was below 10% indicating over 90% TMI usage even under demanding operating parameters. For your production process ask for further details.

10th Year for Safety Award



The British Safety Council International Safety Award is awarded to companies that can demonstrate exceptional safety standards and Epichem is proud to accept the recognition that this award holds for the tenth consecutive year, highlighting the high regard placed on safety and the stringent procedures enforced to ensure operators can produce hazardous chemicals with minimal risks.

The BSC state: **"Only companies with below their industry sector average accident rates are eligible for the award and winners must have good safety policies, plans and commitment to health and safety at the highest Board level. They must detail their health and safety officers' qualifications and provide information about significant advances they have made in health and safety for the year."**

Epichem is committed to a safe working environment and looks forward to continuous success in this area over the coming year to maintain its own high standards.



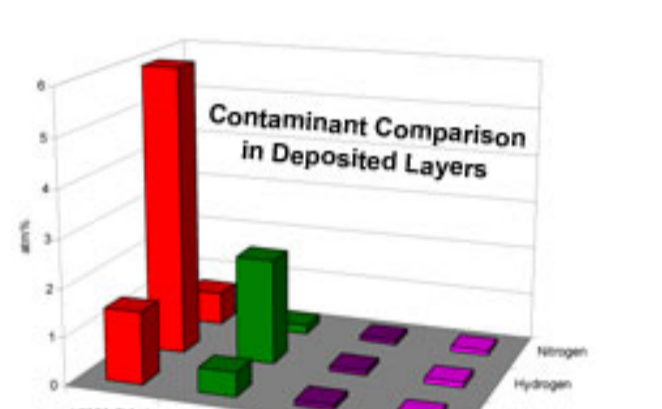
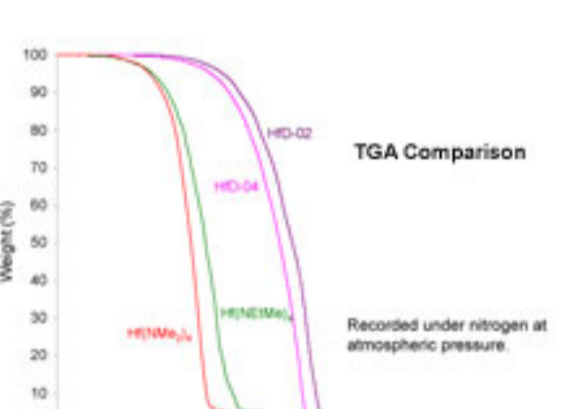
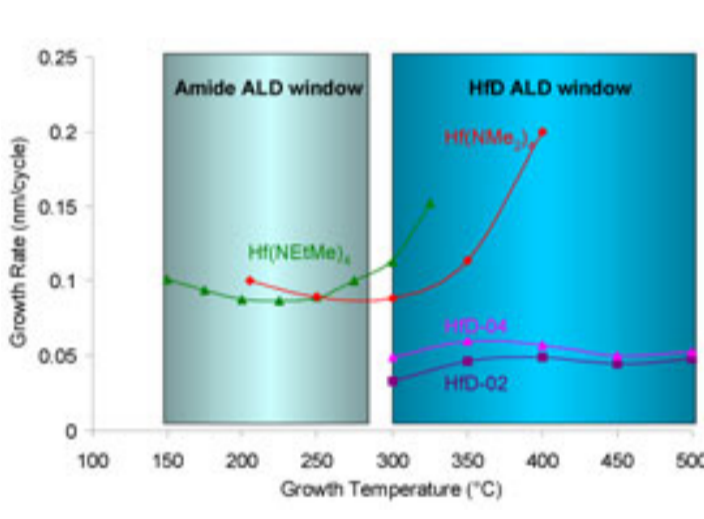
http://www.britishsafetycouncil.co.uk/pages/about_us/newevents/safetyawards.html

New Hf Sources for High Growth Temperature HfO2 by ALD

The demand for "true" ALD growth of High K dielectric layers at temperatures in the 450-500° C deposition regime is of key importance to future generation semiconductor devices.

Epichem has been working on new Hf sources for HfO2 and related material deposition due to the limitations of current alkoxide and amide precursors and can present preliminary results in the figure below. Two new sources (one is a liquid at room temperature) have been identified as holding significant potential with a much higher temperature growth window.

Conformality is maintained for high aspect ratio structures (60:1) with 100% uniform trench filling and electrical measurements on large area capacitors that indicate a factor of 10 decrease in leakage currents compared to similar devices fabricated using Hf(NEtMe)4 and Hf(NMe2)4. Further details of the precursors, their properties and availability will be published in the near future and presented at targeted ALD conferences.



Out and About

Epichem personnel have been out and about during "conference season" to meet customers and network with collaborators at various meetings during the last quarter. The major event was the IC-MOVPE held in Miyazaki, Japan. Exceptionally well attended, this vibrant conference brought together world leading groups in a productive week discussing numerous advances in different material systems and device applications. Two other conferences in the south of France were equally good opportunities to discuss customer requirements in a picturesque setting outside the usual meeting room environment.



For further details of conferences to meet up with Epichem personnel please refer to the first quarter newsletter which details attendance plans for 2006.

New Collaborative Project

REALISE

Rare earth oxide atomic layer deposition for innovations in electronics
EU Funded.

Partners: Tyndall Institute, MDM-INFM, ST Microelectronics, Infineon, Philips Research, CEMES, ASM Microchemistry, Universities of Liverpool and Helsinki

Summary: The project will address the deposition of high permittivity rare earth oxide layers with sub-nanometre control along with the integration of these films into innovative memory and communication devices. The deposition technique of choice will be ALD with liquid injection and vapour transport of precursors possible. A variety of novel precursors will be investigated and the process parameters established to achieve the desired film quality. Scale up issues will also be addressed.

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