

season's greetings

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Dear user_here

Season's greetings from all at SAFC Hitech.

Welcome to the latest edition of SAFC Hitech's Insight e-news. We invite you to forward this message to interested parties at your workplace and encourage them to sign up to receive their own copy in the future.

Festive Season Wishes

2008 has been a year of expansion for SAFC Hitech with the recent launch of the Scintillation Materials product range highlighting the variety of advanced technology markets now falling under our umbrella.

However, our core function remains to be customer oriented and focussed on delivering the service quality that has been a trademark for us over the past 20 years in the semiconductor industry. The full integration of Epichem and Sigma-Aldrich facilities in the SAFC Hitech division has allowed research and technical know-how to be coupled with financial and manufacturing strength to provide unparalleled potential to meet customer needs.

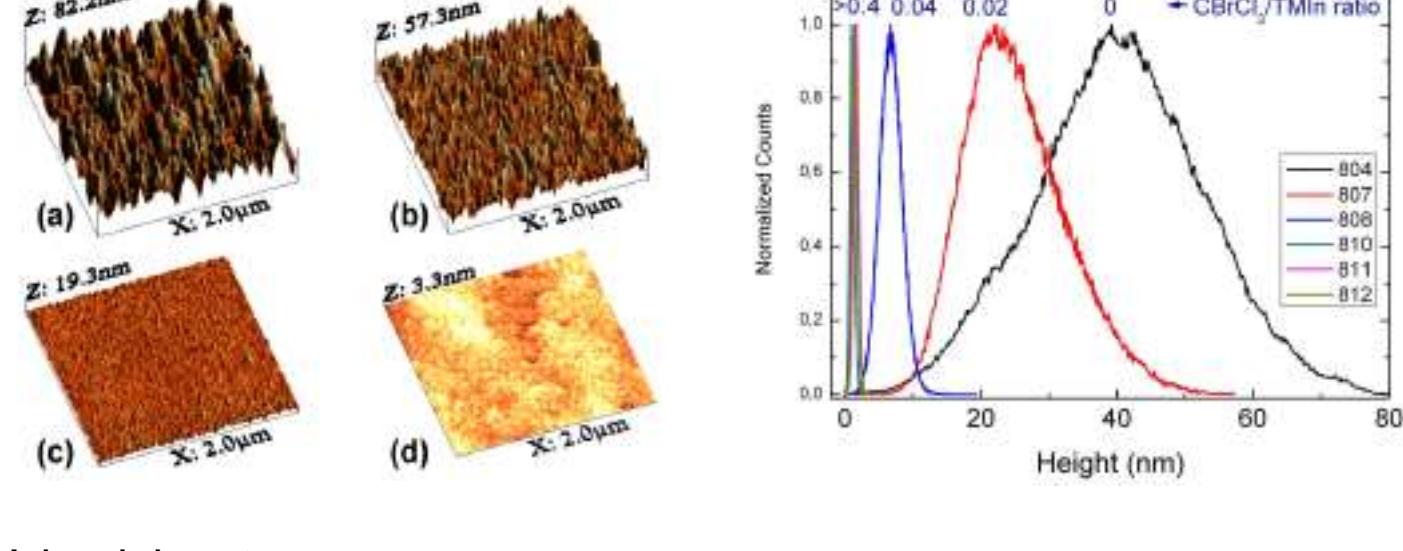
I'd like to thank you all for your continued support in these exciting times and wish you all the best for the festive season and a prosperous new year.

Barry Leese
President
SAFC Hitech

InN Growth Improvements

Recent interest in InN based materials has been revived due to significant improvements in layer quality. The INDOT consortium (SAFC, Aixtron, Montpellier Uni, SAES) have been successful in developing a novel approach to allow the deposition of films with surface roughness values decreased by orders of magnitude such that device fabrication is now a reality.

The co injection of CBrCl₃ has been demonstrated to improve lateral growth and thus produce much smoother layers as highlighted in the AFM results below.

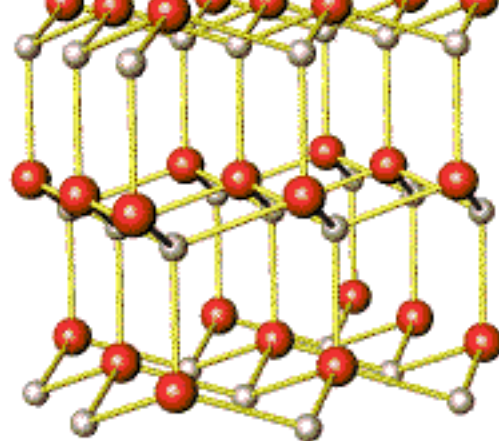


Acknowledgments

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ZnO as a Material for the Future

Zinc Oxide (ZnO) based materials have been of interest for electronic applications for many years in view of their suitable band gap, electron density and electron mobilities. Until now their exploitation has been limited by their electrical conductivity. The output from the SOLCLEAR project involving SAFC, TWI, GE Aviation, DEK and researchers at the Universities of Oxford and Birmingham has highlighted the optimisation of doping this material to greatly improve conduction. A figure of 4% Si in ZnO gave the best results and work is ongoing to transfer this technology to lower temperature processes for transparent conducting coatings on flexible substrates.



ZnO structure
Zn²⁺ in grey
O²⁻ in red

Acknowledgments

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New Research Collaboration For Glass Coating

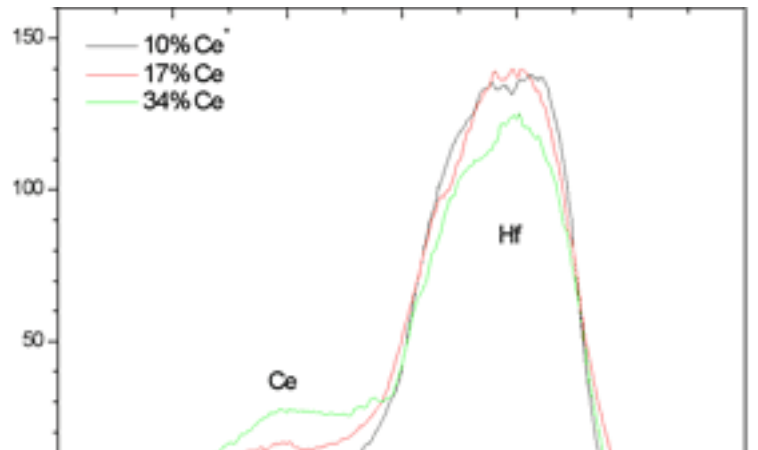
SAFC is pleased to announce a successful bid for support from the Technology Steering Board (TSB), UK in its recent "Components and materials for low impact buildings" call for proposals. A partnership with Academic and Industry groups from the North West will study a variety of coatings on glass aimed at reducing the carbon footprint of new buildings. Starting in 2009 this project will focus on innovative deposition methods and coating combinations to achieve its goals.

Ce Doping of HfO₂ to Increase κ

The adoption of HfO₂ as a high- κ dielectric in the current generation of complementary metal-oxide-semiconductor (CMOS) logic and memory devices has stimulated research to identify modifications to optimise its permittivity. One approach has focused on the stabilisation of the metastable cubic or tetragonal HfO₂ phases and a Ce concentration of 12.5 at.% is predicted to lead to a κ of ~32 due to tetragonal phase

stabilisation. Atomic Layer Deposition (ALD) studies at Liverpool Uni have been successful in proving this theory with experimental data matching closely that from modelling.

Medium energy ion scattering (MEIS) experiments were performed to establish the Ce content which is shown on the right and can be varied in a controlled manner by changing injection ratios for the ALD process.



Precursor Delivery Equipment Advances

The requirement to provide a reliable and controllable gas phase composition of ultrahigh purity precursors to deposition tools employed in production environments is critical to process optimisation and efficiency maximisation. With industry moves to larger volumes of source material utilisation the delivery system can play a key role in decreasing downtime by lengthening the time between bubbler changeouts and indeed for bulk delivery systems avoid these operations at the tool completely.



SAFC has a range of hardware specially developed to suit the semiconductor industry that is capable of handling even the most hazardous compounds safely, whilst providing outstanding performance. Both liquid and vapour based systems are available, namely the well established EpiFill™ and the new EpiVapor™. A recent open day in Taiwan saw much interest by customers and for further details of how these offerings can reduce your costs please contact your local SAFC Hitech representative or visit the website www.safchitech.com



Changes at the Top

SAFC Hitech is part of the wider SAFC Business Unit that forms the manufacturing arm of the Sigma-Aldrich Group. The head of this unit is currently Dr Frank Wicks, however, in the New Year he is moving on to become President of the Research Specialities and Research Essentials Business Units within the company. His successor, Gilles Cottier, whose experience in other Sigma-Aldrich positions will be an excellent fit with the customer driven focus of the SAFC business unit, will take over as the new SAFC President on January 1, 2009. The operation of the SAFC Hitech unit under Barry Leese will remain unchanged.



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