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# IAP-SEMINAR

## EINLADUNG

Termin: **Dienstag, 9.3.2010 um 16:00 Uhr**  
Ort: **Technische Universität Wien,  
Institut für Angewandte Physik,  
Seminarraum 134A, Turm B (gelbe Leitfarbe), 5. OG  
1040 Wien, Wiedner Hauptstraße 8-10**

Vortragender: **Prof. Dr. Christian Mitterer**  
Department of Physical Metallurgy and Materials Testing, University of Leoben

Thema: **Recent advances in the synthesis of Al<sub>2</sub>O<sub>3</sub> coatings**

### Kurzfassung

Al<sub>2</sub>O<sub>3</sub> coatings are widely used for wear and oxidation protection of cutting tools. While high-temperature chemical vapor deposition (CVD) at temperatures of ~1000°C is an industrial standard for depositing the stable  $\alpha$ -Al<sub>2</sub>O<sub>3</sub> and the metastable  $\kappa$ -Al<sub>2</sub>O<sub>3</sub> phases on thermally stable cemented carbide cutting tools, recently physical vapor deposition (PVD) processes have been introduced to synthesize different Al<sub>2</sub>O<sub>3</sub> phases in the temperature range between 500 and 700°C.

The present talk reviews aspects of thermal stability of metastable  $\kappa$ -Al<sub>2</sub>O<sub>3</sub> coatings grown by CVD and metastable  $\gamma$ -Al<sub>2</sub>O<sub>3</sub> / amorphous Al<sub>2</sub>O<sub>3</sub> structures synthesized by pulsed magnetron sputtering, where it could be shown that these metastable coatings are stable up to more than 1000°C. Furthermore, attempts to improve the mechanical properties of CVD  $\alpha$ -Al<sub>2</sub>O<sub>3</sub> coatings by Ti doping and to stabilize the  $\alpha$ -Al<sub>2</sub>O<sub>3</sub> phase by addition of Cr<sub>2</sub>O<sub>3</sub> in a cathodic arc evaporation process are presented.

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*Alle interessierten Kolleginnen und Kollegen sind zu diesem Seminar  
(45 min mit anschließender gemeinsamer Diskussion) herzlich eingeladen.*

*H. Störi e.h.  
(LVA-Leiter)*