

Abstract zur Bachelorarbeit

Fachgebiet: Physik / Optik
Name: Widholz, Georg
Thema: **Tropfenaufprall auf superhydrophobe, nanostrukturierte Oberflächen im elektrischen Feld**
Jahr: 2013
Betreuer: Prof. Dr. rer. nat. Robert Brunner
Dipl.-Ing (FH) Erik Förster

Ziel.

Material und Methode. An experimental setup for measurements of impinging droplets has been created and evaluated. It includes an illumination of little heat radiation, a high speed camera and a plate capacitor that is connected to a high voltage source. Drop impingement experiments on various surfaces such as hydrophilic SiO₂, nanostructured SiO₂ and superhydrophobic silane coated, nanostructured SiO₂ have been made.

Ergebnisse. The data derived from the dynamic analysis indicates an increase of the sessile contact angle when the droplet impinges on a conducting surface in an electric field. Additionally it shows less dampening of the contact angle oscillation. The impingement on the superhydrophobic surface in an electric field displays residue droplets on the surface. In addition the droplet returns to the upper capacitor plate while the residue droplets vanish due to electrolysis and vaporization. In future this might be of use in surface cleaning processes.

Schlussfolgerung.

Schlüsselwörter.

Abstract Bachelor Thesis

Specific Field: Physics / Optics
Name: Widholz, Georg
Bachelor Thesis: **Drop impact on superhydrophobic nanostructured surfaces in an electric field**
Year: 2013
Supervising Tutor: Prof. Dr. rer. nat. Robert Brunner
Dipl.-Ing (FH) Erik Förster

Purpose.

Methods. An experimental setup for measurements of impinging droplets has been created and evaluated. It includes an illumination of little heat radiation, a high speed camera and a plate capacitor that is connected to a high voltage source. Drop impingement experiments on various surfaces such as hydrophilic SiO₂, nanostructured SiO₂ and superhydrophobic silane coated, nanostructured SiO₂ have been made.

Results. The data derived from the dynamic analysis indicates an increase of the sessile contact angle when the droplet impinges on a conducting surface in an electric field. Additionally it shows less dampening of the contact angle oscillation. The impingement on the superhydrophobic surface in an electric field displays residue droplets on the surface. In addition the droplet returns to the upper capacitor plate while the residue droplets vanish due to electrolysis and vaporization. In future this might be of use in surface cleaning processes.

Conclusion.

Keywords.