

# Laura-Lynn I. Fockaert

PhD Candidate



Tel: +31 (0)15 278 2550  
E-mail: l.i.fockaert@tudelft.nl

Research topics:  
metal-polymer hybrid systems  
interfacial bonding  
chromate free pretreatments

## Effect of mobility of H<sub>2</sub>O and ions at polymer-metal interfaces on long-term stability of coated systems

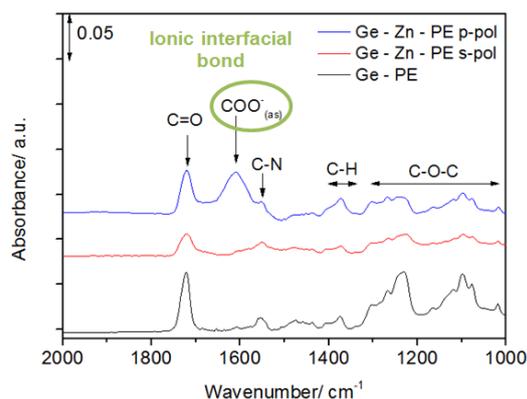
Research activities:

- Attenuated total reflection - Fourier transform infrared spectroscopy (ATR-FTIR) in the Kretschmann geometry, is a powerful tool frequently used to study metal-polymer interfacial chemistry. It is known that the depth from which the FTIR information is generated is in the order of hundreds of nanometers. Therefore, next to the molecular organization at the interface, also the polymer chemistry above the interface contribute to the FTIR signal. Another way to deduce the molecular organization at solid-solid interfaces is by using the inherently surface sensitive tool; visible-infrared sum-frequency generation spectroscopy (SFG). This work unveils the molecular organization at a hidden polyester – zinc interface using both ATR-FTIR and SFG to illustrate the complementarity of both techniques

*This research was done in collaboration with the Institute of Particle Technology (LFG), Friedrich-Alexander-Universität-Erlangen-Nürnberg*

- Zr- and Ti-based conversion coatings as eco-friendly alternatives for Cr(VI)-based surface treatments were studied on their effect on metal-polymer adhesion. Physicochemical characterization of chemically treated galvanized steel was performed using XPS (elemental surface composition and quantification of surface hydroxide fractions) contact angle measurements (wettability),

AFM (surface roughness), EIS (oxide resistance), FTIR (acid-base properties) and pull-off tests (adhesion strength). *A large part of this research was conducted by Maxine Ankora.*



Key publications 2018:

S. Pletincx, L. I. Fockaert, M. Meeusen, J. M. C. Mol, H. Terryn and T. Hauffman "In Situ Methanol Adsorption on Aluminum Oxide Monitored by a Combined ORP-EIS and ATR-FTIR Kretschmann Setup" *J. Phys. Chem.*, 2018, 122 (38), pp 21963–21973.

Y. Li, H. Jahr, K. Lietaert, P. Pavanram, A. Yilmaz, L.I. Fockaert, M. A. Leeflang, B. Pouran, Y. Gonzalez-Garcia, H. Weinans, J. M. C. Mol, J. Zhou, A. A. Zadpoor "Additively manufactured biodegradable porous iron", *Acta biomaterialia*, 77 (2018) 380-393.