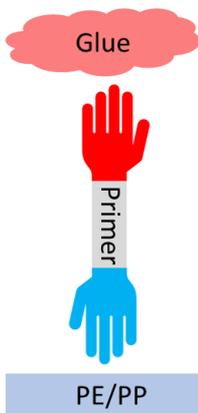


Easy-to-apply chemical pre-treatment for long lasting bonding with typical adhesives on industrial polyolefins

G. Morgese¹, R. Brönimann¹, J. Inauen¹, K. Siegmann¹, M. Winkler¹

¹Institute of Materials and Process Engineering (IMPE), School of Engineering (SoE), Zürich University of Applied Sciences (ZHAW), Technikumstrasse 9, CH-8401 Winterthur, Switzerland.

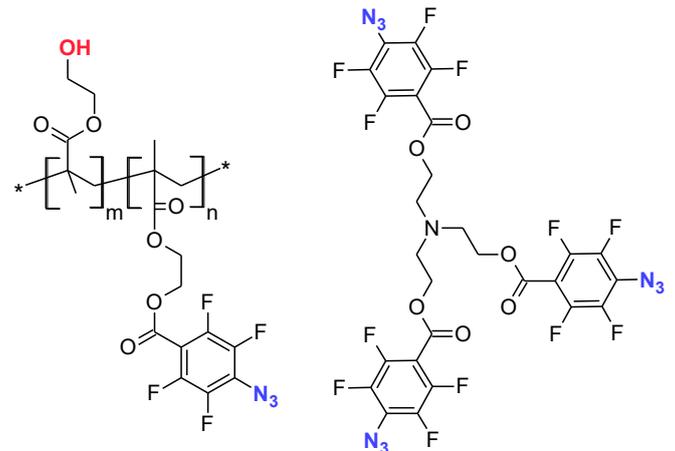


Polyethylene (PE) and polypropylene (PP) are difficult to bond.

Hence, a primer is needed.

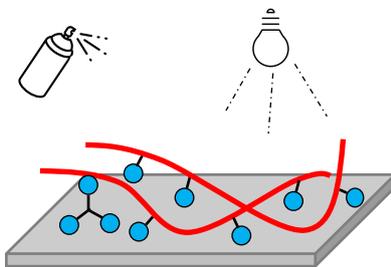
The primer reacts with the **surface** and the **glue**.

To the right, the chemical formulae of the primers are shown. The primer is a mixture of polymer and triazide.

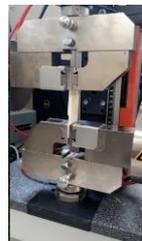


Polymers: P(30), P(40) Triazide: t

a)

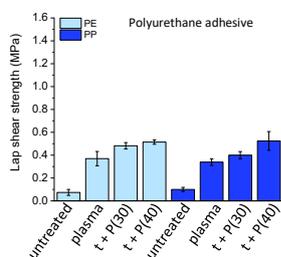


b)

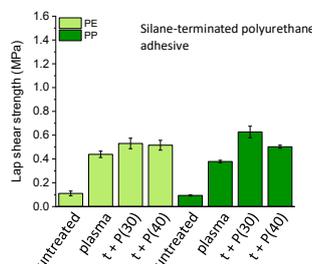


The primer is applied on PE and PP. Then, the surface is treated with UV-light to activate the **azide-group**. The thus generated nitrene intermediate reacts chemically with a C-H bond of the substrate, the primer becomes firmly attached to the surface (a). Two treated substrates are glued together. The bond strength is determined in a tensile test (b). Four different glues were investigated on PE and PP (c-f). Plasma-treated PE and PP are compared to our primers, t + P(30) and t + P(40). It is seen that the bond strength using our primers is equal to or surpasses the bond strength of plasma treated PE and PP for some glues. It was also found that additives in the PE negatively influence bond strength using our primers.

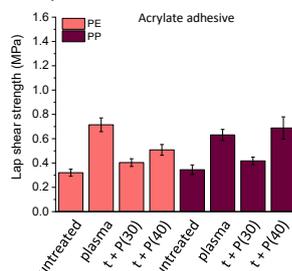
c)



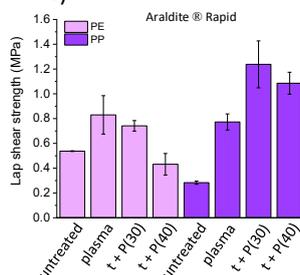
d)



e)



f)



Contact:

giulia.morgese@zhaw.ch
martin.winkler@zhaw.ch

