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Authors: Baris Kaynak, Cüneyt Alpan, Markus Kratzer, Christian Ganser, Christian Teichert, Wolfgang Kern



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## Anti-adhesive layers on stainless steel using thermally stable dipodal perfluoroalkyl silanes (*second revision 21-04-2017*)

Baris Kaynak<sup>a</sup>, Cüneyt Alpan<sup>a, #</sup>, Markus Kratzer<sup>b</sup>, Christian Ganser<sup>b</sup>, Christian Teichert<sup>b</sup>, Wolfgang Kern<sup>a, \*</sup>

<sup>a</sup> *Chair in Chemistry of Polymeric Materials, Montanuniversität Leoben, Otto Glöckel-Strasse 2, A-8700 Leoben, Austria*

<sup>b</sup> *Institute of Physics, Montanuniversität Leoben, Franz Josef Str. 18, A-8700 Leoben, Austria*

\* Corresponding author. *E-mail address:* wolfgang.kern@unileoben.ac.at (W. Kern).

# The present affiliation of C. Alpan is University of Paderborn, Department of Chemistry, Warburger Strasse 100, D-33098 Paderborn, Germany.

### Highlights of research

- Perfluorinated dipodal organosilanes have been synthesized by hydrosilylation reaction
- A modification of stainless steel surfaces has been performed in a two-step procedure comprising a corona activation and the subsequent reaction of surface hydroxyl groups with the dipodal silanes.
- Layers of perfluorinated dipodal organosilanes exhibit significantly higher thermal stability when compared to conventional monopodal organosilanes
- Stainless steel modified with the dipodal perfluoroalkyl silanes exhibits low surface energy and low adhesive force compared to the unmodified steel surface.

### ABSTRACT

In this study steel surfaces are modified with dipodal perfluoroalkyl organosilanes and the resulting wetting properties and surface morphologies are analyzed. Dipodal silane monomers with different fluoroalkyl spacer lengths are synthesized via hydrosilylation reaction. The modification of stainless steel surfaces is performed in a two-step procedure comprising a corona activation of the steel surface and the subsequent reaction of surface hydroxyl groups with the dipodal silanes from the liquid phase. Anti-adhesive behavior on the surface is archived through the modification. The attachment of the dipodal silanes on the stainless steel surface are validated with infrared reflection absorption spectroscopy and X-ray photoelectron

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