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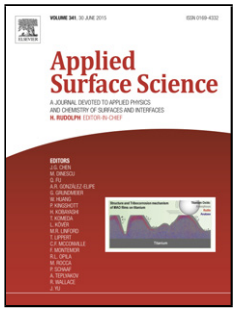

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Anti-adhesive layers on stainless steel using thermally stable dipodal perfluoroalkyl silanes *(second revision 21-04-2017)*

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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.

A B S T R A C T

In this study steel surfaces are modified with dipodal perfluoralkyl 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