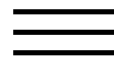


Modification of surface properties of carbon-based and polymeric materials through fluorination routes: From fundamental research to industrial applications.

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Modification of surface properties of carbon-based and polymeric materials through fluorination routes: From fundamental research to industrial applications

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Abstract

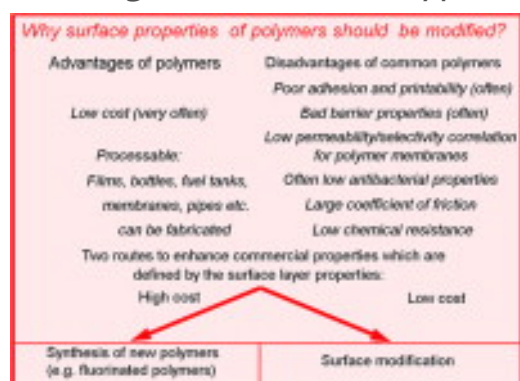
The outstanding characteristics of fluorine gas, e.g., extreme reactivity and oxidizing power, and the utmost electronegativity of  $F^{\hat{a}}$  ion, lead to very strong bonds between fluorine and most of the other elements of the periodical table. Treatments involving  $F_2$ , fluorinated gases and rf plasma-enhanced fluorination (PEF) constitute exceptional tools for modifying the surface properties of materials. Many advantages of these techniques can be indeed outlined, when compared to more conventional methods: low-temperature reactions (even at room temperature), chemical modifications limited to surface only without changing the bulk properties, possible non-equilibrium reactions.

Depending on the type of starting materials and employed techniques, the improved properties may concern wettability, adhesion, chemical stability, barrier properties, biocompatibility, grafting, mechanical behavior. Several examples of surface fluorination will be given on various types of carbon-based materials, elastomers and polymers.

## Graphical abstract

Treatments involving  $F_2$ , fluorinated gases and rf plasma-enhanced fluorination (PEF) constitute exceptional tools for modifying the surface properties of materials.

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## Keywords

Fluorine; Surface fluorination; Fluorinated rf plasmas; Direct fluorination; Carbon materials; Elastomers; Polymers; XPS; Permeation; Membranes

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Modification of surface properties of carbon-based and polymeric materials through fluorination routes: From fundamental research to industrial applications, other things being equal, the procedural change comes to relief.

ARTHUR FIRSTENBERG 1997, the scalar field, as follows from the set of experimental observations, begins mass transfer.