Polytetrafluoroethylene

Subjects: Polymer Science

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Polytetrafluoroethylene is a linear fluoropolymer in which every carbon carries two fluorine atoms, and the resulting sheath of fluorine gives it the lowest surface energy of any common polymer. Because the chains are smooth and the interchain forces are weak, the material has a very low friction coefficient and resists adhesion [1]. The same strong carbon-fluorine bond makes it chemically inert and thermally stable up to about 260 degrees in continuous service [2]. It cannot be processed from the melt in the usual way, because its melt viscosity is far too high for ordinary extrusion, so parts are made by compression moulding and sintering or by paste extrusion [3]. Expanded forms are produced by stretching a paste-extruded tape, which converts the solid into a porous fibrillated membrane for filtration and for clothing laminates [4]. Wear resistance is poor, and fillers, glass or bronze among them, are added when the material must slide against a counterface [5].

fluoropolymer | low surface energy | paste extrusion | expansion | porous membrane | wear resistance | chemical inertness

References

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