Supplementary Material (ESI) for Chemical Communications

Supporting Information for

A New Cross-linking Route via the Unusual Collision Kinematics of Hyperthermal Proton in Unsaturated Hydrocarbon: the Case of Poly(trans-isoprene)

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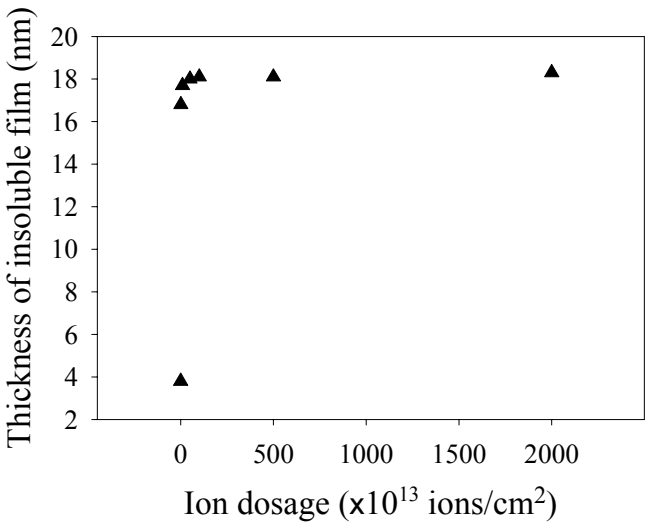
Figure S1. Degree of crosslinking of the PtI film, expressed by the insoluble film thickness after the dissolution test of immersing the film in hexane for 5 minutes as a function of ion fluence for the proton-collision-induced method with 10eV H^+



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Methods

Hyperthermal ion bombardment of the dotriacontane film was carried out in a mass-and-energy-selective low energy ion beam (LEIB) system. Briefly, H^+ projectile ions were produced and extracted from a H_2 plasma in a hot DC filament Colutron ion source. After mass and energy selection, H^+ ions with the desirable kinetic energy were impinged at normal incidence to the sample. The energy spread of the ion beam was about ±0.6 eV. The pressure of sample chamber during ion bombardment was 2×10^{-8} Torr. The beam current was measured with a Faraday cup with a large entrance aperture (3mm diameter) and current density by a Faraday cup with a small entrance aperture. The current density was about 1μA/cm^2 for a beam at 10eV, which is equivalent to a projectile arrival rate of 6×10^{12}/cm^{2}s.

The film surface was mainly characterized by an XPS system having a Kratos AXIS-HS spectrometer equipped with a monochromatic Al K_α source. The XPS chamber and LEIB system are linked together by ultrahigh vacuum connections so that samples can be analyzed, transferred and bombarded without air-exposure. *Ex-situ* AFM measurements were performed using a Nanoscope III AFM system.