

**Reversible on-off switch function of ion-track pores
for thermo-responsive films based on copolymers consisting of
diethyleneglycol-bis-allylcarbonate and acryloyl-L-proline methyl ester**

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Intelligent chemical valves responding to a slight change of temperature were created by the combination of ion beam-chemical etching technique and a novel material consisting of an ion track detector material diethyleneglycol-bis-allylcarbonate (CR-391) and a thermo-responsive gel acryloyl-L-proline methyl ester (A-ProOMe).

The changes in size of ion-track pores in etched films were measured microscopically by repetition between 0 and 30°C at 24-h intervals for a 50 μm thick copoly(CR-39/A-ProOMe, 60/40 mol %) film which was obtained by etching in aqueous 6M NaOH solution at 60°C after an 11.6 MeV/n ^{208}Pb ion irradiation and, as a result, it was found that the pore size in the film obtained by etching for 10 min is reversibly changed from a perfectly closed pore at 0°C to a fully opened pore with a diameter of 0.30 μm at 30°C.