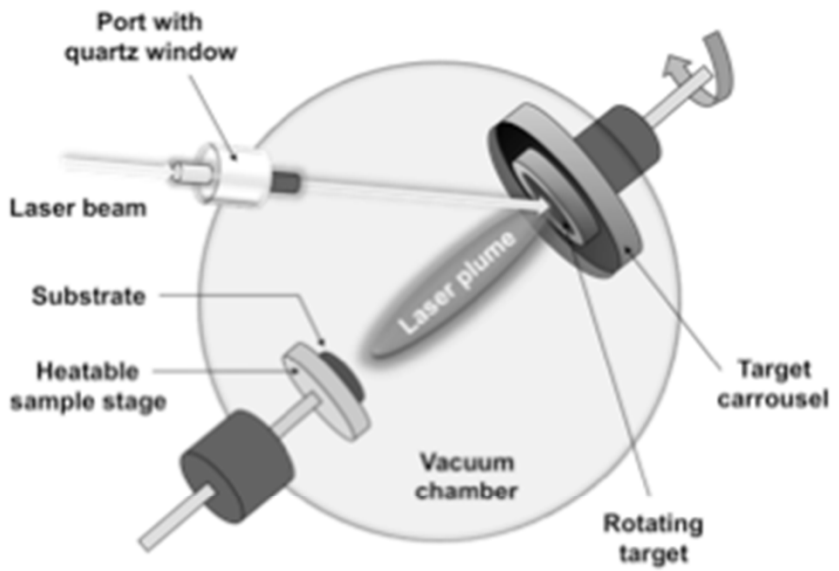
Processing glassy polymeric membranes with enhanced thermal and kinetic stability

Rodney D. Priestley, Chemical and Biological Engineering, Princeton University
Princeton, NJ 08544

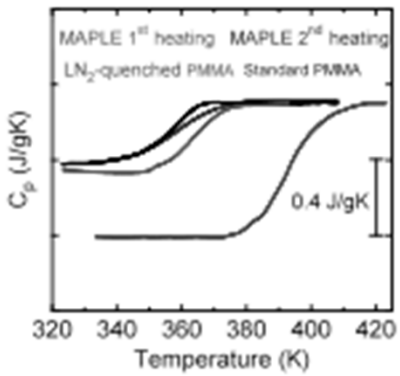
We have investigated the thermal and kinetic stability of matrix-assisted pulsed layer evaporation (MAPLE) - deposited polymer thin films.

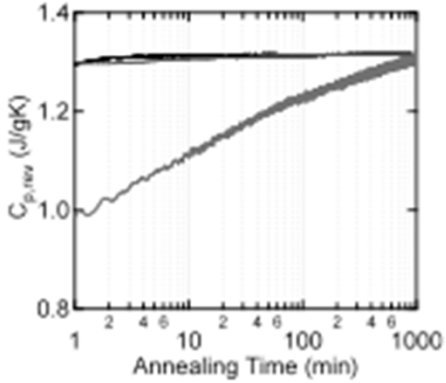
Illustration of MAPLE



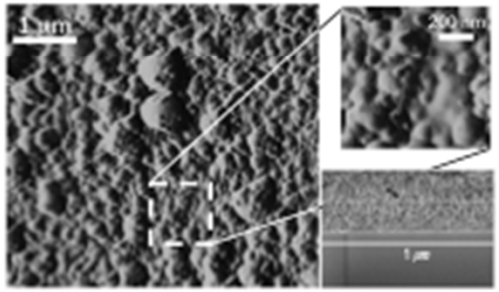
In the MAPLE method, a pulsed laser ablates a target of a frozen solution of the polymer in order to produce thin films of the material.

MAPLE-deposited PMMA films have enhanced glass transition temperatures, i.e., greater thermal stability, compared to spin coated films.





MAPLE-deposited PMMA films exhibit enhanced kinetic stability, i.e., longer time require for glass to liquid transformation at T_g, compared to spin coated films.



MAPLE-deposited PMMA films have a unique nanostructured morphology.