Fast expanding plasma beam deposition of C and Si-thin layers

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In the expanding plasma beam deposition method fast deposition (up to 100 nm/s) is achieved by effective transfer of ionization and dissociation to the injected monomers as CnHm, CO2, and SiH4 from the high-intensity Ar, or Ar/H thermal plasma source. The binding energy in the expanding argon, or argon/hydrogen plasma beam is transferred to the monomers by asymmetric charge exchange and dissociative recombination. Several deposition results on amorphous (a:C–H and a:Si–H) and crystalline (diamond) layers are presented. The role of radicals and ions and the influence of flow and recirculation patterns are discussed.