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# Growth of thin fullerene films by matrix assisted pulsed laser evaporation

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$C_{60}$ fullerene thin films of average thickness of more than 100 nm on silicon substrates can be produced in vacuum by matrix-assisted pulsed laser evaporation (MAPLE). A 355 nm Nd:YAG laser was directed onto a frozen target of anisole with a concentration of 0.67 wt% $C_{60}$. At laser fluences below 1.5 J/cm$^2$ the dominant fraction of the film molecules are $C_{60}$ transferred to the substrate without any fragmentation. For high fluences high-resolution SEM images of MAPLE deposited films reveal large circular features on the surface with high amount of material concentrated at edges. These features, observed over a wide range of laser fluences, are caused by ejection of large matrix-fullerene liquid droplets into the gas-phase and subsequent deposition. At similar laser energies, but using an unfocused laser beam, MAPLE favours evaporation of matrix and organic molecules, resulting in films with smooth surfaces and minimal contamination.