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EXCIMER-LASER-INDUCED CHEMICAL VAPOR DEPOSITION OF COPPER FILMS FROM COPPER TRIFLUOROACETYLACETONATE

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The dynamics of copper film deposition on glass, fused silica and silicon substrates by means of KrF-laser has been investigated. The deposition was carried out on the front and on the back windows of vacuum cell. A two millimeter diameter beam spot were formed at the windows surfases by long-focus lens. A typical deposition rate was $\sim 0.1\text{\AA}/\text{pulse}$. At the film thickness about $1000\text{\AA}$ the ablation on the glass and the silica substrates has been observed.

The role of thermal and photolytical processes occuring at or near the substrate surfaces have been studied. It was shown that at the experimental condition (molecule vapor pressure $\sim 10^{-3}$ torr) the deposition took place by the decomposition of molecules TFA adsorbed on the substrates surfaces.

The comparison of deposition rates on the front and on the back substrates showed that the film deposition was realyzed only by the photolysis. This mode of the process gives rise to the great quantity of carbon impurities (30 - 80%) in films.

The submicrometer periodic structure at the edge of the film spots similar to the structure was observed early at doubled argon-ion laser deposition [1] was found.

1. R.J.Wilson, F.A.Houle. Phys. Rev. Lett. 55, 2184, 1985